

~~CONTACT~~

Class VI

P.No. (01)

Sub - MATHS

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Chapter - 01

ये गं करी →
 ones = वक्र → इसे '0' से सुचित किया जाता है।
 Tens = दहाक → " T "
 Hundred = सैकड़ (सौ) → H "
 Thousand = हजार → Th "
 Lakh = लाख → L "
 Crore = करोड़ → Cr. "
 Million = दस लाख → M "
 Billion = अरब → B "

~~सब~~ धड़कर समझो →

किसी सं. को दो विधियों से लिखा जाता है।

(i) India system of numeration (संख्या को ही भारतीय अंकन पद्धति) → इसमें one, Tens, hundreds, Thousand, Ten thousand, Lakh, Ten Lakh, crore आते हैं।

(ii) International system of numeration (संख्या को ही अंतरराष्ट्रीय पद्धति) → इसमें ones, ones (ones, Tens, hundred), Thousand (Th, 10Th, 100Th), Million (1M, 10m, 100m), Billion (1B, 10B, 100B) आते हैं।

INDIAN system में place value chart.

period →	CRORE		LAKH		Thousand		ONES
place →	10Cr	1Cr	10L	1L	10Th	Th	H T O

Example → 52 35 46 268 → ~~digit~~ → 52 crore 35 lakhs 46 Th 2 hundred sixty eight.
 Cr. L Th. ones → period →

INTERNATIONAL SYSTEM में place value chart.

BILLION			MILLION			THOUSAND			ONES		
100B	10B	1B	100M	10M	1M	100Th	10Th	1Th	H	T	O

Example - 12 52 35 46 268

M L Th. ones → period



12 million five hundred twenty three million five hundred forty six thousand two hundred and forty six

NOTE (i) Indian system में दारिणी नरक से पहलै तीन अंक तथा उसके बाद दो-दो अंकों का period बनाया जाता है तथा कॉमा (,) दिया जाता है।

(ii) International system में दारिणी नरक से तीन-तीन अंकों का period बनाते हैं तथा प्रत्येक period के बाद Comma (,) दिया जाता है।

उपर के नियमों को समझने के बाद Exercise - case बनावें। →

P.T.O →

EXERCISE - 1.1

1. Fill in the blanks →

Solution! — (a) 1 lakh = (10) ten thousand.(b) Rough →

1 lakh = 100000

Ten thousand = 10,000

1 Lakh ÷ Ten thousand

~~100~~
 $100000 \div 10000 =$

$= \frac{100000}{10000} = \text{(10)}$

(b) 1 million = $\frac{10}{100}$ hundred thousand.

Solution → $1000000 \div 100000$

$= \frac{1000000}{100000} = \text{(10) Ans}$

(c) 1 crore = 10 ten lakh.

(d) 1 crore = 10 million.

(e) 1 million = 10 lakh.

उपर की वर ६

गुणाकार देना है।

2. अंक में समूह करना देना है।

(a) 73 75 307 = 73, 75, 307. (ये Indian system है)

(b) 90 5000 40 = 9, 05, 00, 040 Ans 1)

(c) 752, 21, 302 Ans (11)

(d) 5, 842 3 202 = 58, 423, 202 Ans (International system)

(e) ~~23 30 010~~ 23 30 010 = 23, 30, 010 Ans (Indian system)

(3) (i) $8,75,95,762 =$ Eight crore seventy five lakh ninety five thousand seven hundred and sixty two

(ii) $85,46,283 =$ Eighty five lakh forty six thousand two hundred eighty three

(iii) $9,99,00,046 =$ Nine crore ninety nine lakh forty six.

(iv) $9,84,32,701 =$ Nine crore, eighty four lakh thirty two thousand seven hundred one.

(4) (a) $\underset{M}{78}, \underset{Th}{921}, \underset{0}{092} =$ 78 million, nine hundred twenty one thousand, ninety two.

(b) $\underset{M}{7}, \underset{Th}{452}, \underset{0}{283} =$ Seven million, four hundred fifty two thousand two hundred eighty three.

(iii) $\underset{M}{99}, \underset{Th}{985}, \underset{0}{102} =$ Ninety nine million, nine hundred eighty five thousand, one hundred two.

(iv) $\underset{M}{48}, \underset{Th}{049}, \underset{0}{831} \rightarrow$ forty eight million forty nine thousand eight hundred and thirty one.

— X —
EX-102

(1) The total number of tickets sold in four days = $1094 + 1812 + 2050 + 2751 = 7707$ tickets Ans

(2) sold \rightarrow Runs needed = $10000 - 6980 = 3020$ run Ans

③ The number of votes won = 577500
 $- 348700$
 $= 228800$ Ans

④ In first week = ₹ 285 891
 In second week = ₹ 400 768
 ∴ Total sale in two weeks = ₹ 686 659 Ans

Difference in the sale amount = 400768
 $- 285891$
 $= 114877$

∴ sale in the second week was more by ₹ 114877. Ans

⑤ The greatest number = 76432
 The least number = 23467
 ∴ Difference = 52965 Ans

⑥ Days in month of January = 31 days.
 Total manufactured screws = 2825×31
 $= 87575$ Ans

Rough.

2825
x 31
2825
8475
87575

Total money the merchant had = ₹ 78592

⑦ The cost of 1 radio = ₹ 1200.
 ∴ The cost of 40 radio = $1200 \times 40 = ₹ 48000$
 ∴ Remainder money = 78592
 $- 48000$
 $= ₹ 30592$ Ans

8

~~7236~~
 Required difference = $7236 \times 65 - 7236 \times 56$
~~7236~~
 $= 470340 - 405216$
 $= 65124 \text{ Ans.}$

9 Total cloth = $40 \text{ m} = 40 \times 100 = 4000 \text{ cm.}$
 Needed cloth for a shirt = $2 \text{ m } 15 \text{ cm} = 2 \times 100 + 15$
 $= 215 \text{ cm.}$

∴ Number of shirts = $4000 \div 215$
 $= 18 \text{ shirts Ans.}$
 Remains (Remainder) = 130 cm
 $= 1 \text{ m } 30 \text{ cm Ans.}$

Rough

215)	4000	(18
		215		
		1850		
		1720		
		<u>130</u>		

10

The van can carry a ^{max} weight of 800 kg
 $= 800 \times 1000 \text{ g}$
 $= 800000 \text{ gm.}$

Weight of one box = $4 \text{ kg } 500 \text{ gm}$
 $= 4 \times 1000 + 500$ [∵ $1 \text{ kg} = 1000 \text{ gm}$]
 $= 4000 + 500$
 $= 4500 \text{ gm}$

∴ Number of ^{loaded} ~~shirts~~ boxes = $800000 \div 4500$

4500)	800000	(177
		4500		
		35000		
		31500		
		<u>35000</u>		
		31500		
		<u>3500</u>		

$= 177 \text{ boxes Ans.}$

Distance of school from house = 1 km 875 m.
 Distance travelled in both ways = 1 km 875 m x 2
 in one day = km - m

$$\begin{array}{r}
 1 - 875 \\
 \times 2 \\
 \hline
 3 - 750 = 3 \text{ km } 750 \text{ m}
 \end{array}$$

Distance travelled in 6 days = 3 km 750 m x 6

$$\begin{array}{r}
 \text{km} - \text{m} \\
 3 - 750 \\
 \times 6 \\
 \hline
 22 - 500 \\
 = 22 \text{ km } 500 \text{ m} \text{ Ans}
 \end{array}$$

(12) The capacity of vessel = 4 l 500 ml
 = 4 x 1000 + 500 [∵ 1 l = 1000 ml]
 = 4000 + 500
 = 4500 ml.

The capacity of one glass = 25 ml.

Number of glasses = 4500 ÷ 25

$$\begin{array}{r}
 25 \overline{) 4500} \quad (180) \\
 \underline{25} \\
 200 \\
 \underline{200} \\
 0
 \end{array}$$

= 180 ml Ans

Estimation to the nearest tens by rounding off

(1) Nearest tens → की हुई सं० को ~~less~~ nearest tens rounding off करना है वीं उस सं० के दहाई कांक से

(i) यदि 5 या 5 से अधिक होगा तो दहाई कांक से 1 जोड़ कर उसके आगे वाले दहाई कांक को शून्य कर देंगे। जैसे 17 का दहाई कांक 7 है जो 5 से अधिक है। अतः इसकी दहाई कांक 1 को जोड़ कर 7 के स्थान पर शून्य लिख देंगे। अतः यह 20 हो जाएगा।

(ii) यदि 5 से कम होगा तो उस सं० के दहाई कांक को 0 का 0 का रखकर उसके आगे के कांक को शून्य में बदल देंगे। जैसे 24 का दहाई कांक 4 जो 5 से कम है। अतः यह 20 होगा।

2. Nearest hundred → इसमें उपर के दो नौ नियम दहाई पर लागू होंगे।

- जैसे (i) 225 इसमें दहाई कांक 2 < 5
= 200 Ans
- (ii) 250 = इसमें दहाई कांक 5 = 5
= 300 Ans

3. Nearest thousand → इसमें hundred के कांक उपर के दो नौ नियम लागू होंगे।

4. Nearest ten thousand - इसमें thousand कांक ten thousand के दो नौ कां साव लीकर एक उपर के नियमों को लागू करेंगे।
17,986 इसमें 9 > 5
= 18000 Ans

EX-1.3

(1) Estimate using general rule (rounded off to tens) -

(1) (a) $730 \rightarrow 730$ (rounded off to tens)
 $998 \rightarrow +1000$
 Sum = 1730 Ans.

(b) $796 \Rightarrow 800$
 $314 \rightarrow -310$
 Diff = 490 Ans.

(c) $12,904 \Rightarrow 12,900$
 $2888 \rightarrow +2890$
 Sum \rightarrow 15790

(d) Do your self. (स्वयं करो) तथा अपने मन से इस प्रकार इस प्रश्न को हल कर स्वयं बनाओ।

(2) (a) Round off to hundreds | Round off to tens

(a) $439 \rightarrow 400$
 $334 \rightarrow 300$
 $4317 \rightarrow 4300$

$439 \rightarrow 440$
 $334 \rightarrow 330$
 $4317 \rightarrow 4320$

Estimated sum \rightarrow 5000

Estimated sum \rightarrow 5090

(b) $1,08,734 \rightarrow 1,08,700$
 $47,599 \rightarrow -47,600$

$1,08,734 \rightarrow 1,08,730$
 $47,599 \rightarrow 47,600$

Estimated diff = 61100 Ans.

Est. diff \rightarrow 61130 Ans.

(c) स्वयं करो (Do yourself)

Do yourself

(d) स्वयं करो (Do yourself)
 इसी प्रकार के चार उदाहरण स्वयं लिखें।

Do yourself

Ex-2.1

1. The next three natural number after 10999

$$= 10999+1, 10999+2, 10999+3$$

$$= 11000, 11001, 11002 \text{ Ans}$$

$$\left. \begin{aligned} 10999+1 &= 11000 \\ 11000+1 &= 11001 \\ 11001+1 &= 11002 \end{aligned} \right\} \text{ Ans}$$

2. Three whole numbers just before 10001

$$= 10001-1, 10001-2, 10001-3$$

$$= 10000, 9999, 9998 \text{ Ans}$$

$$\left. \begin{aligned} 10001-1 &= 10000 \\ 10000-1 &= 9999 \\ 9999-1 &= 9998 \end{aligned} \right\} \text{ Ans}$$

3. The smallest whole number is 0 (zero). Ans

4. Total whole numbers between 53 and 32 =

$$= (53-32)-1 = 21-1 = 20 \text{ Ans}$$

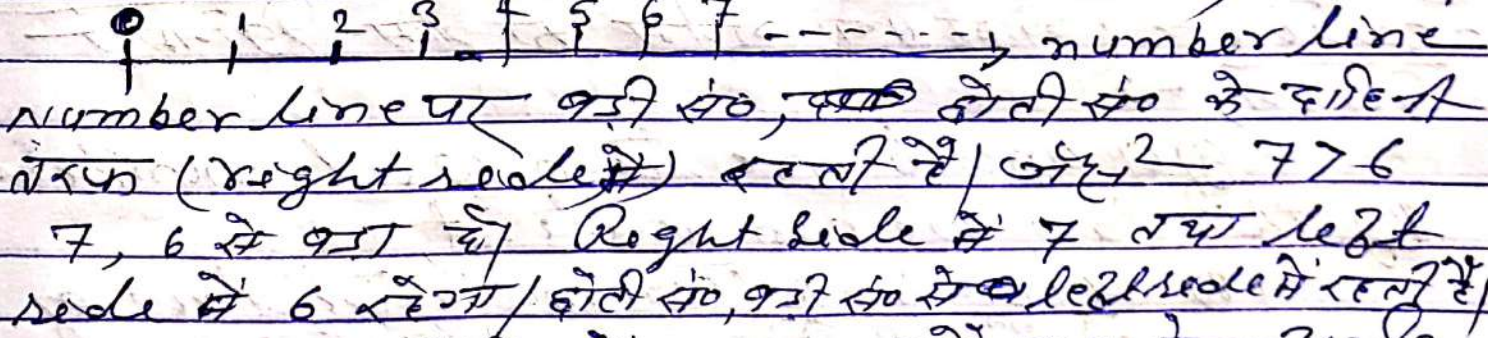
5. (a) Successor of 2440701 = $2440701+1 = 2440702$ Ans

(b), (c), (d) → ~~क~~ (a) की तरह स्वयं करो।

6. (a) The predecessor of 94 = $94-1 = 93$ Ans

(b), (c), (d) → (a) की तरह स्वयं करो।

7. समानता → $>$ = Greater than (बड़ा है) $=$ Equal to (समान है)
 $<$ = Smaller than (छोटा है) \neq Not equal (असमान है)



7. (a) 530, 503 दो सं० में 530 बड़ा है 503 से अर्थात्

$$\begin{matrix} 530 & > & 503 \\ \text{Right} & & \text{Left} \end{matrix}$$

503 is on left side of 530 Ans

(b), (c), (d) → (a) की तरह स्वयं करो।

8. (a) F (b) T ($\because 400-1=399$) (c) T (d) F ($\because 600+1=601 \neq 599$)
 (e) T (f) F (\because zero is not a natural number) (g) F (\because predecessor of 10 = $10-1=9$)
 (h) F (i) T (j) F (k) F (113 और 123 के बीच 13 नहीं है)
 (l) T (m) F (predecessor of 99 = $99-1=98$)

Ex-2.2 से पहले इन नोट्स को पढ़कर समझ लें :-

PROPERTIES OF WHOLE NUMBERS (पूर्व संख्याओं के गुण) →

(i) Closure property (संवरण गुण) → The sum (योगफल) or the product (गुणनफल) of two whole numbers is always a whole number. Ex

$0 \times 2 = 0, 2 \times 3 = 6, 0 + 2 = 2, 2 + 3 = 5$
 $0, 2, 6, 5$ all are whole numbers.

यह नियम केवल जोड़ और गुणा पर ही लागू होता है

(ii) Commutative law of Add and multi-
-cation → (योग तथा गुणन का क्रम-विनिमय गुण) →

If a and b are two whole numbers
 By this law we can write it

(a) $a + b = b + a$ (commutative law of Addition)
 (b) $a \times b = b \times a$ (commutative law of multiplication) → $C + C \times$

(ii) Associative law of Add and multiply →
 (योग एवं गुणन का साहचर्य गुण) →

If a, b and c are three whole numbers.
 Then we can write it ~~through~~ according to this law,

(a) $a + (b + c) = (a + b) + c$ (Associative law of addition)

इसमें Bracket पहले दो अंकों वाले या वया अंक में गुणन वाले दो numbers पर रहते हैं।

(b) $(a \times b) \times c = a \times (b \times c)$ (Associative law of multiply)

(iv) Distributive law (वितरण का गुण गुणन) →
 If a, b and c are three whole numbers.
 By this law, we can write it,

$a \times (b + c) = a \times b + a \times c$

It is distributivity of multiplication over addition (घटने पर गुणन का वितरण गुण)

(v) $0 \div a$ (any whole number) = 0

(vi) $a \div 0 = \text{not defined}$ (अपरिभाषित)

(vii) Identity element (व्यसमक अवयव) →

किसी भी whole number को गुणन करने पर कोई भी संख्या बरकरार रहती है उसे identity element of multiplication कहते हैं। यह संख्या 1 (one) है।

उदाहरण → $4 \times 1 = 4$
 $0 \times 1 = 0$
 $5 \times 1 = 5$

यदि 1 से गुणा करेंगे तो गुणनफल वही रहेगा।
 यथा $4 \times 1 = 4$
 $0 \times 1 = 0$
 $5 \times 1 = 5$

(b) क्या whole number जैसे किसी ~~को~~ whole number में जोड़ने पर कोई परिवर्तन नहीं होता है
 0 यह संख्या zero (0) है। जोड़ने

$$0 + 0 = 0$$

$$1 + 0 = 1$$

$$2 + 0 = 2$$

EX - 2.2

1. (a) $837 + 208 + 363$ इसमें दो ही संख्याओं को पुनर्र्थन करके साथ जोड़ना है जिससे योगफल round figure (सु-युक्त) आता है।
 $= (837 + 363) + 208$
 $= 1200 + 208$
 $= 1408 \text{ Ans.}$

(b) $1962 + 453 + 1538 + 647$
 $= (1962 + 1538) + (453 + 647)$
 $= 3500 + 1100$
 $= 4600 \text{ Ans.}$

2. (a) $2 \times 1768 \times 50$
 $= 2 \times 50 \times 1768$
 $= 100 \times 1768$
 $= 176800 \text{ km}$

(b) $4 \times 106 \times 25$
 $= 4 \times 25 \times 106$
 $= 100 \times 106$
 $= 10600 \text{ km}$

(c) $8 \times 291 \times 125$
 $= 8 \times 125 \times 291$
 $= 1000 \times 291$
 $= 291000 \text{ km}$

(d) $625 \times 279 \times 16$
 $= (16 \times 625) \times 279$
 $= 10000 \times 279 = 2790000 \text{ km}$

(e) $285 \times 5 \times 60$
 $= (5 \times 60) \times 285$
 $= 300 \times 285$
 $= 85500 \text{ km}$

(f) $125 \times 40 \times 8 \times 25$
 $= (125 \times 8) \times (40 \times 25)$
 $= 1000 \times 1000 = 1000000 \text{ km}$

EX - 2.2

(3) (a) $\frac{297 \times 17}{a \quad b} + \frac{293 \times 43}{a \quad c}$

यह $297 \times b + 293 \times c$ के रूप में है।

Distributive law से $a \times b + a \times c$

$= a \times (b + c)$ [$\because a$ दो दोनों में $\therefore a$ का b का c दोनों में गुणा है]

$297 \times 17 + 293 \times 43 = 293 \times (17 + 43)$

$= 293 \times 60 = \del{8790} \text{ Ans}$

$= 5860 \text{ Ans}$

(b) $54279 \times 92 + 8 \times 54279$

$= 54279 \times (92 + 8) = 54279 \times 100 = 5427900 \text{ Ans}$

(c) $81265 \times 169 - 81265 \times 69 = 81265 \times (169 - 69)$

$= 81265 \times 100$

$= 8126500 \text{ Ans}$

(d) $3845 \times 5 \times 782 + 769 \times 25 \times 218$

$= 19225 \times 782 + 19225 \times 218$

$= 19225 \times (782 + 218)$

$= 19225 \times 1000$

$= 19225000 \text{ Ans}$

(4) (a) 738×103

$= 738 \times (100 + 3)$

$= 738 \times 100 + 738 \times 3$

$= 73800 + 2214$

$= 76014 \text{ Ans}$

(b) में 102 की जगह 100 पर

(c) में 1008 " " " 1000 + 8

(d) में 1005 " " " 1000 + 5

इसलिए (a) की तरह बनाना है

इसी प्रकार (b), (c), (d) बनाएँ

⑤ petrol filled on monday = 40L
 " " " next day = 50L
 Total filled petrol in these two days
 = 40 + 50 = 90L.

∴ The cost of 1L of petrol = ₹ 44.
 " " " 90 " " = ₹ 44 × 90
 = ₹ 3960 Ans

⑥ Total supplied milk = 32L + 68L = 100L
 ∴ The cost of 1L milk = ₹ 45
 " " " 100L " = ₹ 45 × 100 = ₹ 4500 Ans

⑦ (i) → (c), (ii) → (a), (iii) → (b).

Ex. — 2.3.

① 1. → (a) Ans

2. Yes, we can say that one of them or both of them will be zero.

Example — $3 \times 0 = 0$, $0 \times 4 = 0$, $0 \times 0 = 0$
 $0 \times 3 = 0$, $4 \times 0 = 0$ etc.

~~3. No, we cannot say both are one.~~

3. NO, we cannot say one of them is zero. because if only one number be 1 then the product cannot be 1.

Example — $3 \times 1 = 3$, $6 \times 1 = 6$, $9 \times 1 = 9$.

If both the numbers are one then the product will be zero. $\Rightarrow 1 \times 1 = 1$

④ (a) $728 \times 101 = 728 \times (100 + 1) = 728 \times 100 + 728 \times 1$
 $= 72800 + 728 = 73528$ Ans

इसी प्रकार (b), (c), (d), (e) बनाइए (e) में 504 के जागते पर 500 + 4 लिखेंगे

(5) $1 \times 8 + 1 = 9$
 $12 \times 8 + 2 = 98$
 $123 \times 8 + 3 = 987$
 $1234 \times 8 + 4 = 9876$
 $12345 \times 8 + 5 = 98765$

(i) $123456 \times 8 + 6 = 987654$

(ii) $1234567 \times 8 + 7 = 9876543$

pattern works as above.

पहले इसे समझें - CHAPTER - 03

Factor \rightarrow कटने वाली सं० \rightarrow अपवर्णक
 multiples \rightarrow कटने वाली सं० \rightarrow अपवर्णक

Factors of 6 = 6 को कटने वाली सं० जहाँ 6 निक सं० के पूरी-पूरी विभाजित हो जाए
 $= 1, 2, 3, 6 \rightarrow$ Factors of 6.

multiple of 6 = 6 से कटने वाली सं० जहाँ 6 से जो सं० कट जाए $\rightarrow 6, 12, 18, 24, 30, \dots$

आइए इसे समझें - ~~Ex~~

(i) PERFECT NUMBER \rightarrow A number for which sum of all its factors is equal to twice (दोगुना) the number is called perfect number.

ex - 6 and 28

factors of 6 = 1, 2, 3, 6,
 sum of factors of 6 = $1 + 2 + 3 + 6$
 $= 12 = 2 \times 6$

factors of 28 = 1, 2, 4, 7, 14, 28
 sum of factors = $1 + 2 + 4 + 7 + 14 + 28$
 $= 56$
 $= 2 \times 28$

अभाज्य संख्या याद करो
 (ii) PRIME NUMBER → Those numbers other than 1 whose only two factors 1 and number itself are called prime numbers.
 Ex - 2, 3, 5, 7, 11 etc.

factor of 2 = 1, 2, (1 and number itself 2).

factor of 7 = 1, 7. etc.

अभाज्य संख्या
 (iii) COMPOSITE NUMBER → Numbers having more than two factors are called composite number. Ex - factors of 4 = 1, 2, 4 (more than two factors)
 " " 6 = 1, 2, 3, 6.
 " " 8 = 1, 2, 4, 8. etc.

(iv) EVEN NUMBER (सम संख्या) → Those numbers which are perfectly divisible by 2 are called even numbers. Ex - 2, 4, 6, 8, ...

(v) ODD NUMBER (असम संख्या) → Those numbers which are not perfectly divisible by 2 are called odd numbers. Ex - 1, 3, 5, 7, etc.

Ex. - 30

- ① (a) Factors of 24 = 1, 2, 3, 4, 6, 8, 12, 24. And इसी प्रकार (b) स (ii) नक बनाके।
- ② (a) First five multiple of 5 = 5, 10, 15, 20, 25. इसी प्रकार (b) और (c) बनाके।
- ③ खर्च के match करें।
- ④ 1 से 100 के बीच 9 से पूरी-पूरी करने वाली संख्या को कौन कहेंगे। जहाँ - 9, 18, 27, ... 99.

Ex-3.2

① (a) The sum of any two odd numbers = $3+7=10$ in

(b) The sum of any two even numbers = $8+12=20$

② (a) F (b) T (c) T (d) F (e) F (f) F (g) F
(h) T (i) T (j) T

③ 17 and 71, 37 and 73, 79 and 97. Am

④ prime numbers upto 20 = 2, 3, 5, 7, 11, 13, 17, 19.
composite numbers upto 20 = 4, 6, 8, 9, 10, 12, 14, 15, 16, 18. Am

⑤ The greatest prime number between 1 and 10 = 7 Am

(6) (a) $44 = 3+41$ (b) $36 = 5+31$, (c) $24 = 5+19, 7+17$.

(d) $18 = 5+13, 7+11$.

7. ~~WIN~~ ^{PRIME} → Two consecutive prime numbers whose difference is 2 are called twin primes.

✓ 3 and 5, 5 and 7, 11 and 13. Am

CO-PRIME NUMBERS → Two numbers having only 1 as common factor is called co-prime

⑧ (a) and (c) Am

⑨ 90, 91, 92, 93, 94, 95, 96 are seven consecutive composite numbers so that there is no prime numbers between them.

⑩ (a) $21 = 3+5+13$ (b) $31 = 3+5+23$ (c) $53 = 3+19+31$
(d) $61 = 3+11+47$.

⑪ $2+3=5, 7+13=20, 3+17=20, 2+13=15, 5+5=10$

⑫ (a) prime number (b) composite number
(c) prime, composite (d) 2 (e) 4 (f) 2.
—————x—————

किताब के page NO- 54, 55, 56, 57 में दिए Divisibility के नियमों को पाठ करें। (सौदे और काले डायर वाले वाले करें)

EX-3.3

(1) इनमें कौन कौन Number 2, 3, 4, 5, 6, 8, 9, 10, 11 से कटेगा जिससे मिलेगा/उत्तर है YES जिससे नहीं कटेगा NO

Number	2	3	4	5	6	8	9	10	11
128	YES	NO	YES	NO	NO	YES	NO	NO	NO
990	YES	YES	NO	YES	YES	NO	YES	YES	YES
1586	YES	NO	NO	NO	NO	NO	NO	NO	NO
275	NO	NO	NO	YES	NO	NO	NO	NO	YES
6686	YES	NO	NO	NO	NO	NO	NO	NO	NO
639210	YES	YES	NO	YES	YES	NO	NO	YES	YES
429714	YES	YES	NO	NO	YES	NO	YES	NO	NO
21856	YES	YES	YES	NO	YES	YES	NO	NO	NO
3060	YES	YES	YES	YES	YES	NO	YES	YES	NO
406839	NO	YES	NO	NO	NO	NO	NO	NO	NO

2, 3, 4, 5, 6, 8, 9, 10, 11 के लिए नियमों को ध्यान से पढ़ें।
 ये नियमों को ध्यान से पढ़ें।

2. (a) 572 → Divisible by 4 because its last two digits (72) is perfectly divisible by 4.

572 → Not divisible by 8 because its last three digits (572) is not perfectly divisible by 8.

(b) 726352 → Divisible by 4 because its last two digits (52) is divisible by 4.

726352 → Divisible by 8 because its last three digits (352) is perfectly divisible by 8.

इसी प्रकार (c), (d), (e), (f), (g), (h), (i), (j) करना है। इसे ध्यान से पढ़ें।

3. Divisibility by 6 \rightarrow If a number is divisible by 2 and 3 both, then the number is divisible by 6.

(a) 297144 \rightarrow Divisible by 2 because ~~is~~ the digit in ones place is even number.

297144 $\rightarrow 2+9+7+1+4+4 = 27$, is divisible by 3.

\therefore This number is divisible by 3.

\therefore 297144 is divisible by 2 and 3 both.

\therefore It is also divisible by 6. Ans

(b), (c), (d), (e), (f), (g), (h), (i), (j) ~~30~~ or (d) of the
~~द्वय वनाश~~

4. Divisibility by 11 \rightarrow If the difference between sum of even place the digits in even place and the sum of the odd place is 0 or divisible by 11. Then the number is also divisible by 11.

(a) 5445

The sum of the digits in even place (5445)
 $= 4 + 4 = 9 \cdot I$

The sum of the digits in odd place (5445)
 $= 5 + 5 = 9 \cdot II$

\therefore The difference = ~~2~~ $I - II = 9 - 9 = 0$

\therefore 5445 is divisible by 11. Ans

4. (b) 10824.

The sum of the digits in odd place =
 $= 1 + 8 + 4 = 13$.

The sum of the digits in even place
 $= 0 + 2 = 2$

\therefore Difference of the sums = $13 - 2 = 11$ is divisible by 11

\therefore The number 10824 is divisible by 11. Ans

(c), (d), (e), (f) \rightarrow 292 (a) 31467 नरह अनवै,

5. Divisibility by 3 \rightarrow If the sum of all the digits of the number is divisible by 3 then the given number is also divisible by 3.

(a) - 6724

Sum of the digits = $6 + 7 + 2 + 4 = 19$

(3 के पहात में 19 है 21 का निकटतम संख्या है जो 3 से गुणनीय है।
 $3 \times 7 = 21$)

Smallest required number = $21 - 19 = 2$ Ans

~~(b) 4765~~

~~Sum of the digits = $4 + 7 + 6 + 5 + 2 = 24$~~

Greaterst required number = 8 Ans ($3 \times 9 = 27$
 $27 - 19 = 8$)

(b) 4765 - 2

Sum of digits = $4 + 7 + 6 + 5 + 2 = 24$ which is divisible by 3.

\therefore The smallest no. = 0 Ans

The greaterst no. = 9 Ans

6. 92-389

sum of even place = $2 + 3 + 9 = 14$

sum of odd place = $9 + 8 = 17 + 8 = 25$

∴ Required number = 8 Ans

(b) 8-9484

sum of odd place = $8 + 9 + 8 = 25$

∴ even place = ~~6~~ $4 + 4 = 8 + 6 = 14$

∴ Diff = $25 - 14 = 11$

∴ Required NO = 6 Ans

Ex. - 3.4

1. (a) factors of 20 = (1, 2, 4, 5, 10, 20)

factors of 28 = (1, 2, 4, 7, 14, 28)

∴ common factors = 1, 2, 4 Ans

Common factors = जो-जो factor दोनो में मिलेगा

(b) (c) + (d) → 492 का

2. (a) factors of 4 = (1, 2, 4)

factors of 8 = (1, 2, 4, 8)

factors of 12 = (1, 2, 3, 4, 6, 12)

∴ common factors = 1, 2, 4 Ans

इस प्रकार (b) में बताएंगे

3. (a) multiple of 6 = 6, 12, 18, (24), 30, 36, 42, (48), 54, 60, 66, (72), 78

multiple of 8 = 8, 16, (24), 32, 40, (48), 56, 64, (72)

∴ Common multiple = 24, 48, 72 Ans (जो दोनो में मिलेगा)

(b) → (a) में 492 का

4. multiple of 3 = 3, 6, 9, (12) 15, 18, 21, 24 --- 99
 multiple of 4 = 4, 8, (12) 16, 20, 24 - - - - - 96, 100.

common multiple = 12, 24, 36, 48, 60, 72, 84,

एक ही common multiple सामान्यतः 3 सम संख्या समानता (12, 24, 36, 48, 60, 72, 84, 96, 100) में आता है।

96 Ans (96 तक 4 और 3 100 तक ही आता है)

5. यदि common factor केवल 1 है तो इसे दो co-prime कहलाता है।

(a) Factors of 18 = 1, 2, 3, 6, 9, 18
 Factors of 35 = 1, 5, 7, 35

∴ common factor = 1

∴ दोनों का common factor केवल 1 है

∴ They are co-prime number Ans

इसी प्रकार (b), (c), (d), (e), (f) बताये।

(6) The number ∴ Required no. = $5 \times 12 = 60$ Ans.

(7) Required other numbers = factors of 12 = 1, 2, 3, 4, 6, 12 Ans.

NOTE - PN-59, (para-3-6) में (i) (ii) (iii) & (iv) में माँटे 'अंशों' को माप करने सबसे पहले इस प्रकार है -

(i) यदि कोई संख्या दूसरी संख्या से विभाज्य हो तो वह संख्या दूसरी संख्या के प्रत्येक गुणनखंड से भी विभाज्य होगा। जैसे -

~~6 है 12 के factors में~~

12 यदि 6 से विभाज्य है तो 12 के गुणनखंड 1, 2, 3 से भी विभाज्य होगा।

संख्या-विभाजन संख्या

CO-PRIME NUMBER → Two numbers whose common factor is only 1 or $HCF=1$ then they are called co-primes. जैसे - 2 and 3, 3 and 5, 5 and 7 etc.

(ii) यदि कोई संख्या दो co-prime numbers से उत्पन्न होगी तो पूरी-पूरी विभाजित हो जाएगी यदि नहीं वह उनके गुणनफल से भी विभाजित होनी चाहिए।
 80, 4 और 5 से उत्पन्न होगा पूरी-पूरी विभाजित है।
 $\therefore 80 = 4 \times 5 = 20$ से भी पूरी-पूरी विभाजित हो जाएगा।

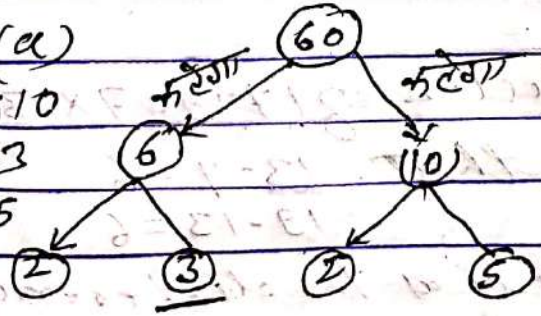
(iii) यदि दो संख्याएँ उत्पन्न होंगी तो उन संख्याओं का योगफल उस संख्या से पूरा-पूरा विभाजित होगा। जैसे -
 16 और 20 दोनों 4 से विभाजित हैं।
 $16 + 20 = 36$ भी 4 से विभाजित होगा।
 $20 - 16 = 4$, 4 से विभाजित होगा।

EX - 3.5

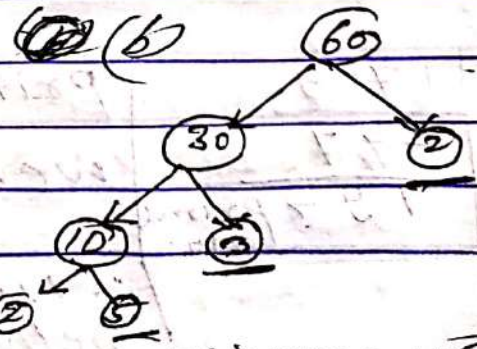
- (1) (a) False (b) True (c) True (d) True
 (e) False (f) False (g) True (h) True

\therefore (b), (c), (d), (g), (h) are True Ans

2. (a)
 $60 = 6 \times 10$
 $6 = 2 \times 3$
 $10 = 2 \times 5$



missing number = 3 Ans



missing no = 4, 2, 3, 5 Ans

Ex-35

3. 1 and number itself are not included.

4. The greatest 4-digit number = 9999

(Prime factorisation of 10000 is $2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5$ and the prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 --- etc.)

For 9999 its prime factors are

3	9999
3	3333
11	1111
	101 → prime number

The prime factors of 9999 = $3 \times 3 \times 11 \times 101$ Ans.

(5) The smallest five digit number = 10000

2	10000	: Prime factors of 10000 = $2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5$ Ans.
2	5000	
2	2500	
2	1250	
5	625	
5	125	
5	25	
5	5	

5 → prime number

7	1729	Prime factors of 1729 = $7 \times 13 \times 19$ We see that $13 - 7 = 6$ $19 - 13 = 6$ ∴ We see that the difference between two consecutive (consecutive) factors = 6.
13	247	
	19 → prime no.	

- (7) Example (i) $2 \times 3 \times 4 = 24$ (ii) $4 \times 5 \times 6 = 120$.
24 and 120 are multiple of 6 Ans.

- (8) ^{example \rightarrow}
 $5 + 5 = 8$, divisible by 4. [3 and 5 are two consecutive odd numbers.]
 $5 + 7 = 12$ " "
 $7 + 9 = 16$ " "
 $9 + 11 = 20$ " "
 $11 + 13 = 24$ " "

- (9) (a) $24 = 2 \times 3 \times 4$, NO because 4 is not a prime number.
 (b) $56 = 2 \times 2 \times 2 \times 7$, YES. All the numbers are prime numbers.
 (c) $70 = 2 \times 5 \times 7$, YES
 (d) $54 = 2 \times 3 \times 9$, NO because 9 is not a prime number.

- (10) 25110. $45 = 5 \times 9$
 The digit in ones place = 0
 \therefore It is divisible by 5.

The sum of the digits of 25110 = $2 + 5 + 1 + 1 + 0$
 $= 9$ is divisible by 9.

\therefore We can say that 25110 is ~~also~~ divisible by 5 and 9 both.

\therefore It is also divisible by $5 \times 9 = 45$ Ans

- (11) No, 12 is a number which is divisible by 6 and 4. but not divisible by $6 \times 4 = 24$. Ans

- (12) Smallest ~~prime~~ four prime numbers are = 2, 3, 5, 7
 \therefore product = $2 \times 3 \times 5 \times 7 = 210$ Ans.

EX. → 3.6

H.C.F. - Highest common factor
 = ~~सर्वोच्च समापक~~ (सर्वोच्च)

1. (a) Find the HCF -
 18 and 48 → HCF of 18 and 48 → HCF(18, 48)

2	18	2	48	$18 = 2 \times 2 \times 3$ $24 = 2 \times 2 \times 2 \times 2 \times 3$ $HCF(18, 48) = 2 \times 2 \times 3 = 12$ Ans
3	9	2	24	
	3	2	12	
	2		6	
		3	3	

NOTE → जो factor सबसे मिलेगा उसे निकालेंगे

(g) 70, 105, 175

2	70	3	105	5	175
5	35	5	35	5	35
	7		7		7

$70 = 2 \times 5 \times 7$
 $105 = 3 \times 5 \times 7$
 $175 = 5 \times 5 \times 7$
 $HCF(70, 105, 175) = 5 \times 7 = 35$ Ans

NOTE → जो factor सभी देंगे उसे निकालेंगे। यदि एक में भी नहीं रहेगा तो उसे हटा देंगे। यदि कोई factor न मिले तो HCF = 1 होगा।

सभी 2 नों को वही नरह से खप बनाई

2. (a) HCF of two consecutive (समान) numbers = 1

ex → 4 and 5

$4 = 2 \times 2$
 $5 = 1 \times 5$
 $HCF = 1$

(2)(b) HCF of 2 consecutive even numbers = 2 Ans
example - take two consecutive no = 6 and 8

$6 = 2 \times 3, 8 = 2 \times 2 \times 2 \therefore \text{HCF} = 2$ Ans

(c) HCF of two consecutive odd numbers = 1 Ans
example - 3 and 5

$3 = 1 \times 3$

$5 = 1 \times 5$

HCF = 1 Ans

3. NO, The correct HCF = 1 Ans

EX - 3.7.

1. C.M. → Lowest common multiple
(न्यूनतम समापवर्तक) → लघुसं.

NOTE → सबसे Greatest number निकालना ही ही HCF तथा smallest number निकालना ही ही LCM निकालना जाता है

Greatest या highest या maximum - एक ही चीज
Smallest या lowest या minimum - एक ही चीज

1. maximum weight निकालना है / सं. : 3 सं. का HCF निकालेंगे

3	75	3	69
5	25		23
	5		

~~Factors~~ Factors of 75 = $3 \times 5 \times 5$
Factors of 69 = 3×23
 $\therefore \text{HCF} = 3$

\therefore Required weight = 3 Ans

2. minimum distance निकालना है \therefore LCM निकालेंगे

Len. of 63, 70, 77

63, 70, 77
 9, 10, 11

$$L.C.M. = 7 \times 9 \times 10 \times 11$$

$$= 6930 \text{ cm}$$

∴ The minimum distance = 6930 cm.
 = 69 m 30 cm Ans

3. Longest tape of length $\frac{1}{2}$ m
 ∴ HCF (मन्तव्य)
 HCF of 825 cm, 675 cm, 450 cm.

5	825	5	675	2	450
5	165	3	135	3	225
3	33	3	45	3	75
	11	3	15	5	25
		5		5	

$$825 = 5 \times 5 \times 3 \times 11$$

$$675 = 5 \times 3 \times 3 \times 3 \times 5$$

$$450 = 2 \times 3 \times 3 \times 5 \times 5$$

$$\therefore \text{HCF} = 5 \times 5 \times 3 = 75 \text{ cm}$$

∴ The measurement of longest tape = 75 cm Ans

$$\textcircled{4} \quad \begin{array}{l} 2 \mid 6, 8, 12 \\ 3 \mid 3, 4, 6 \\ 2 \mid 1, 4, 2 \\ \quad \quad \quad 2 \end{array}$$

$$\text{Lcm} = 2 \times 3 \times 2 \times 2 = 24$$

The smallest 3-digit number = 100

$$\begin{array}{r} 24 \overline{) 100} \quad (4) \\ \underline{96} \\ 4 \end{array}$$

$$\therefore \text{Required no} = 100 + (24 - 4) \\ = 100 + 20 = 120 \text{ Ans}$$

$$\textcircled{5} \quad \begin{array}{l} 2 \mid 8, 10, 12 \\ 2 \mid 4, 5, 6 \\ \quad \quad \quad 2 \mid 5, 3 \end{array}$$

$$\text{Lcm} = 2 \times 2 \times 2 \times 5 \times 3 = 120$$

The largest 3-digit no = 999

$$\begin{array}{r} 120 \overline{) 999} \quad (8) \\ \underline{960} \\ 39 \end{array}$$

$$\therefore \text{Required no} = 999 - 39 = 960 \text{ Ans}$$

⑥ 2	48, 72, 108
2	24, 36, 54
2	12, 18, 27
3	6, 9, 27
3	2, 3, 9
	2, 3, 3

$$60 \overline{) 432} \begin{matrix} 7 \\ 20 \\ 12 \end{matrix}$$

LCM = $2 \times 2 \times 2 \times 3 \times 3 \times 2 \times 3$

= ~~432~~ 432 Second = 7 min 12 sec.

∴ Time they change again = 7.9.m + 7min 12sec.
 = 7:07:12^{a.m.}

⑦ maximum capacity of container is :- H.C.F of 403, 434, 465

13 403	2 434	3 465
31	217	155
	31	31

403 = 13 × 31
 434 = 2 × 7 × 31
 465 = 3 × 5 × 31

∴ H.C.F = 31

∴ Required capacity of container = 31 litres.

$$\begin{array}{r|l} 2 & 6, 15, 18 \\ \hline 3 & 3, 5, 9 \\ \hline & 1, 5, 3 \end{array}$$

LCM = $2 \times 3 \times 5 \times 3 = 90$

∴ Required no = $90 + 5 = 95$ Ans

$$\begin{array}{r|l} 2 & 18, 24, 32 \\ \hline 2 & 9, 12, 16 \\ \hline 2 & 9, 6, 8 \\ \hline 3 & 3, 3, 4 \\ \hline & 3, 1, 4 \end{array}$$

LCM = $2 \times 2 \times 2 \times 3 \times 3 \times 4 = 288$

The Smallest no. of

4 digits = 1000

$$\begin{array}{r} 288 \overline{) 1000} \\ \underline{864} \\ 136 \end{array}$$

∴ Required NO = $1000 + (288 - 136) = 1000 + 152 = 1152$ Ans

$$\begin{array}{r|l} 3 & 9 \\ \hline & 3 \end{array} \quad \begin{array}{r|l} 2 & 4 \\ \hline & 2 \end{array}$$

(b)

$12 = 2 \times 2 \times 3$

$5 = 1 \times 5$

LCM = $2 \times 2 \times 3 \times 5$

= 60 Ans

$9 = 3 \times 3$
 $4 = 2 \times 2$ (common factor)

LCM = $3 \times 3 \times 2 \times 2 = 36$ Ans

(c) $6 = 2 \times 3$
 $5 = 1 \times 5$

LCM = $2 \times 3 \times 5 = 30$ Ans

(d) $15 = 3 \times 5$
 $4 = 2 \times 2$

∴ LCM = $3 \times 5 \times 2 \times 2 = 60$ Ans

Yes, the LCM is product of two numbers.

(11) (a) $5 = 1 \times 5$
 $20 = 2 \times 2 \times 5$
 $LCM = 5 \times 2 \times 2$
 $= 20 \text{ Ans}$

क्रिया \rightarrow पहले सब में जो रहेगा
~~उसको लिख देंगे~~ - फिर
~~एक एक को देखें~~ व व
 जिसका ~~बड़ा~~ हुआ हुआ रहेगा
 उसको ही लिख देंगे।

(b) $6 = 2 \times 3$
 $18 = 2 \times 3 \times 3$
 $LCM = 3 \times 2 \times 3$
 $= 18 \text{ Ans}$

(c) $12 = 2 \times 2 \times 3$
 $48 = 2 \times 2 \times 2 \times 2 \times 3$
 $LCM = 2 \times 2 \times 3 \times 2 \times 2$
 $= 48 \text{ Ans}$

(d) $9 = 3 \times 3$
 $45 = 3 \times 3 \times 5$
 $LCM = 3 \times 3 \times 5$
 $= 45 \text{ Ans}$

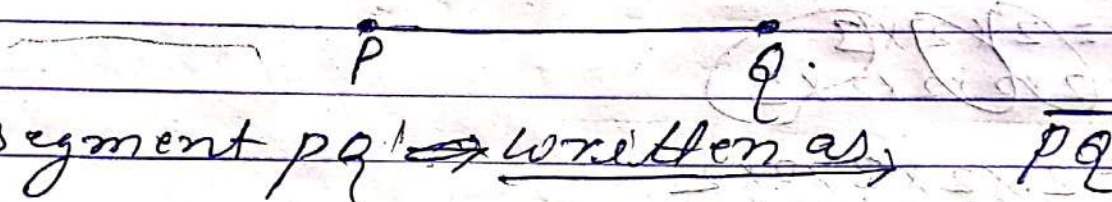
We observe that if one number is factor
 of other number then the largest no.
 is LCM. \rightarrow \times

Basic geometrical ideas

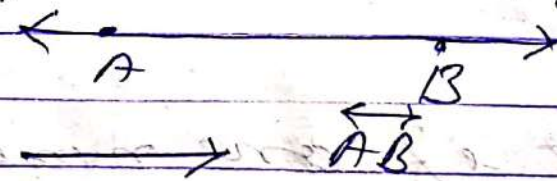
(i) POINT (बिंदु) \rightarrow The dot which has no length, breadth and height. This dot (•) is called point. It has fixed place.

• A \rightarrow point A.

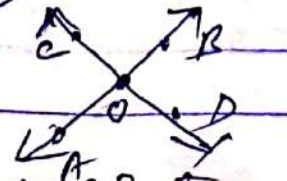
(ii) LINE SEGMENT (खण्ड): - A line which has a definite length is called line segment. It has two fixed end points.



(iii) LINE (रेखा) \rightarrow That geometrical figure which has only length not breadth and height is called line. It has no end points. It can be extended on both sides infinitely.



(iv) INTERSECTING LINES (परिच्छेदी रेखाएँ) \rightarrow If two lines pass through the same point then they are called intersecting line.

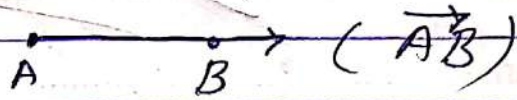


AB and CD pass through the same point O.

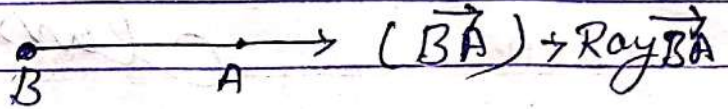
(v) PARALLEL LINE \rightarrow If two lines in the same plane do not intersect each other. They are parallel.

CHAPTER-4

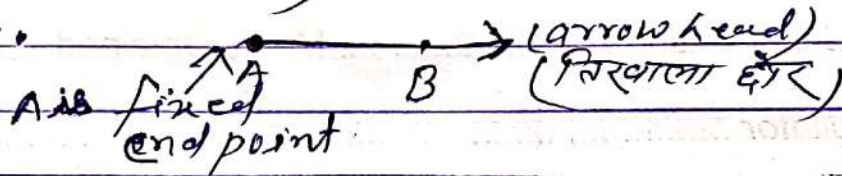
DEFINE → (i) RAY: → A line segment extended indefinitely in one direction is called a ray (किरण).



Ray AB → \vec{AB}



It has only one fixed end point and other end (arrowhead) can be extended infinitely.

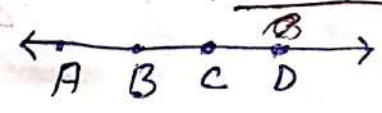


Exercise-4.1

- (1) (a) ^{Pro →} The name of five points in figure are D, E, O, B and C.
- (b) The names may be line DE (\overleftrightarrow{DE}), \overleftrightarrow{DB} , \overleftrightarrow{DO} , \overleftrightarrow{DE} .
- (c) The name of four rays are \vec{OD} (\vec{DO}), \vec{OE} , \vec{OB} , and \vec{OC} .
- (d) The name of five line segments → \overline{DE} , \overline{EO} , \overline{OB} , \overline{OC} , \overline{OD} .

EX-4.1

2. \vec{AB} , \vec{AC} , \vec{AD} , \vec{BC} , \vec{BD} ,



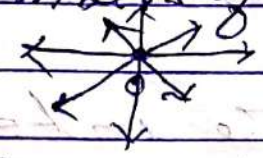
3. (a) Line containing point E (वे लाइन जिस पर E स्थित है) = \vec{AE} or \vec{FE}

(b) Line passing through A = \vec{AE} , \vec{DE} .

(c) Line on which a lies = \vec{OC} .

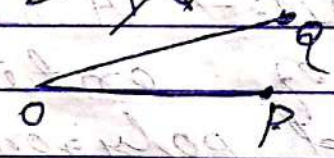
(d) Two pairs of intersecting lines = \vec{AD} and \vec{CB} , \vec{AE} and \vec{FE} .

4. (a) Infinite numbers of lines. (b) only one line.



5. (a) (b) (c) (d)

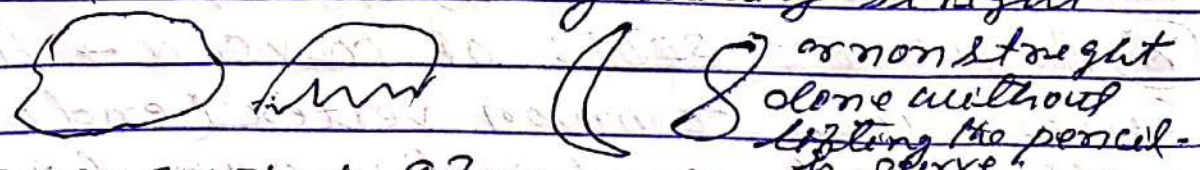
(e)



6. (a) F (b) T (c) T (d) F (e) F (g) T (h) F
(i) F (j) F (k) T

(i) CURVE (वक्र) A line or outline which gradually deviates from being straight for some or all of its length is called curve.

or A figure drawn by deviated line is called curve. or Any drawing straight or non straight



(ii) SIMPLE CURVE: If a curve does not cross itself is called simple curve.

Remember it

(iii) INTERIOR OF CURVE: - The inner part of or inside of a curve is called interior of curve.

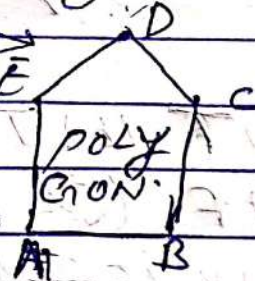
(iv) EXTERIOR OF CURVE: - The outer part of or outside of a curve is called exterior part of curve.

(v) BOUNDARY OF CURVE: - The line surround the curve or forms a curve is called its boundary.

(vi) REGION OF CURVE: - The interior of a curve together with its boundary is called its region.

(vii) POLYGON: - A simple closed figure made up of entirely of line segments is called polygon (over 5).

(viii) Sides of a polygon: - The line segments forming a polygon are called sides of polygon. AB, CD, DE, BC, AE are sides.



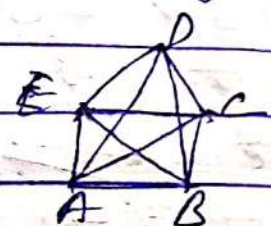
(ix) VERTEX: - The meeting point of sides are called vertex. A, B, C, D, and E are vertex.

(x) ADJACENT SIDES OF POLYGON: - Any two sides with common vertex (endpoints) are called adjacent sides. AB and BC, AB and AE, CD and DE.

Remember it.

(XI) ADJACENT VERTICES: → The end points of the same side of a polygon are called adjacent vertices. D and E, A and B, B and C, C and D.

(XII) DIAGONALS OF POLYGON → The joins of the pairs of vertices which are not adjacent are called diagonals (Dakul). AC, BD, AD etc. are diagonals.



EXERCISE - 4.2.

1. (a) open (b) closed (c) open (d) closed (e) closed.

2. (a) open curve → U, N, ~, T, O

(b) closed curve → triangle, crescent, circle



The shaded portion is the interior of polygon PQRST.

4. (a) yes (b) yes.

5. (a) (b) (c) it is not possible

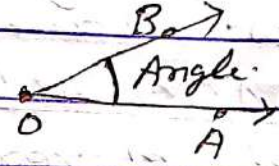
(c) it is not possible because polygon is a closed curve or figure.

— X —

साध करो :-

(i) ANGLE (कोण) → The bending (झुकाव) of one ray upon another ray is called angle.

यह कोण बिंदु O पर बना है।

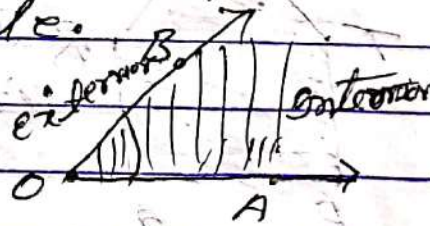


इसे संकेत में कोण O (LO) या LAOB या LBOA लिखा जाता है। जिस बिंदु (O) पर कोण बना है, उसे बीच (LAOB, LBOA) में लिखा जाता है। ~~कोण~~ ANGLE की परिभाषा इस प्रकार की हो सकती है -

ANGLE → ~~An angle is~~ A figure formed by two rays with the same initial (प्रारंभिक) points. is called an angle.

(ii) ARMS OF ANGLE :- The two rays forming an angle are called its sides. OA and OB are sides of angle.

(iii) VERTEX (शीर्ष) → The common initial point is called the vertex of angle.



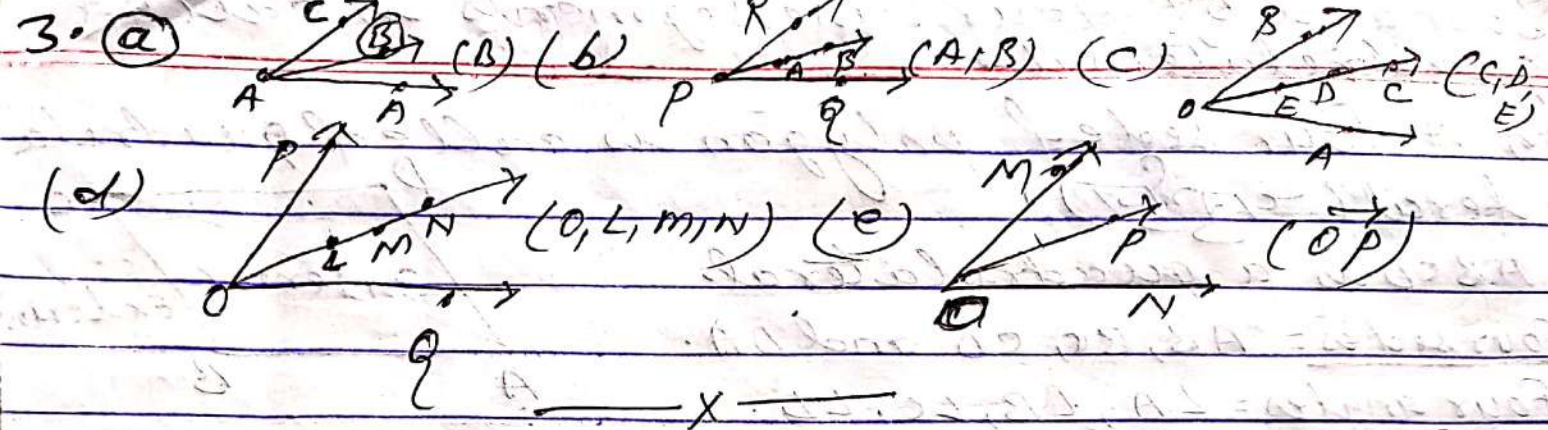
EXERCISE-4.3

1. Name of the angles in given figure are - LA, LB, LC and LD or LBAD, LABC, LBCD, LCDA

2. (a) Name of the points in the interior of LOB is A.

(b) Name of the point in the exterior of LOB is C, D, A.

2(C) Name of the point on $\angle EOF$ is E, O, F, B Am



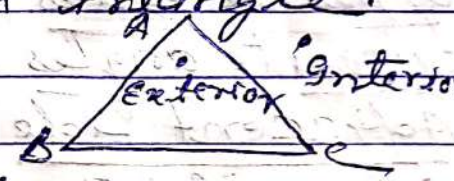
TRIANGLE → A closed figure bounded by three line segments is called triangle.

ABC is a triangle → $\triangle ABC$

\overline{AB} , \overline{BC} , \overline{CA} are its sides.

$\angle A$, $\angle B$ and $\angle C$ are its three angles.

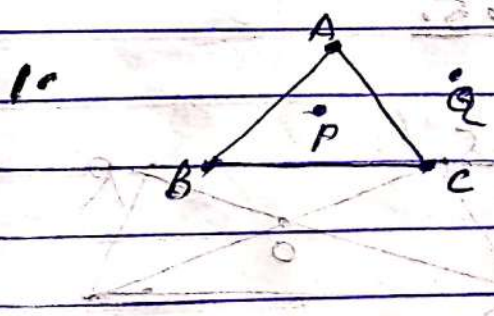
A point A , B and C are its three vertices (V's)



It is three sided polygon.

that is least number of sides in a polygon.

EXERCISE - 4.4



1. A is not in interior and not in exterior. It lies on it is the vertex of triangle.

2. (a) $\triangle ABC$, $\triangle ABD$, $\triangle ADC$.

(b) $\angle BAC$, $\angle ABC$, $\angle ACB$, $\angle BAD$, $\angle DAC$, $\angle ADB$, $\angle ADC$.

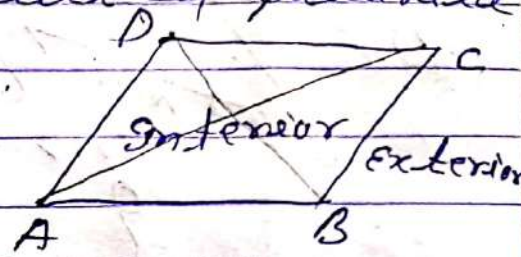
(c) \overline{AB} , \overline{AC} , \overline{BC} , \overline{AD} , \overline{BD} , \overline{DC}

(d) $\triangle ABD$ and $\triangle ABC$

QUADRILATERAL: \rightarrow A closed figure bounded by four line segments is called quadrilateral.

or, A four sided polygon is called quadrilateral (चतुर्भुज);

ABCD is a quadrilateral.



Four sides = AB, BC, CD and DA.

Four angles = $\angle A, \angle B, \angle C, \angle D$.

Four vertices = points A, B, C, D.

opposite sides (आपसमें भिन्न) = AB; CD and AD; BC.

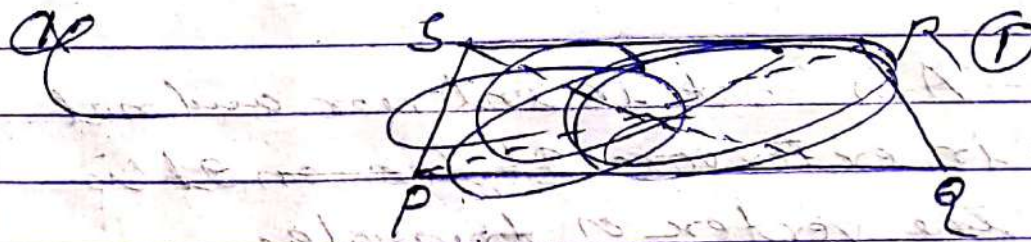
opposite angles = $\angle A$ and $\angle C, \angle B$ and $\angle D$.

Adjacent side = AB and BC, BC and CD, CD and DA, DA and AB.

Adjacent angle = $\angle A$ and $\angle B, \angle B$ and $\angle C, \angle C$ and $\angle D, \angle D$ and $\angle A$.

Diagonals \rightarrow AC and BD.

EXERCISE - 4.5.



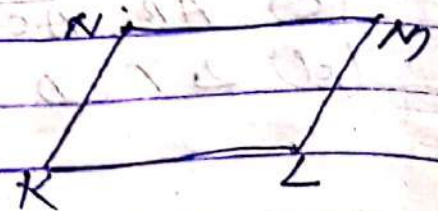
pqrs is a quadrilateral. PR and qs are its diagonals which are meeting at the point o lies in the interior of quadrilateral.

(2) (a) KL and MN, LM and NK.

(b) LK and LM, LL and LN.

(c) KN and NM, KL and LM.

(d) LK and LL, LK and LN.



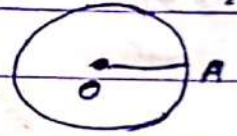
(3) ~~we find that the triangle is not distorted but quadrilateral is distorted.~~

(3) We find that the triangle is not distorted. (पुंजाताना वा व्यसृजाना) pull or twist. but quadrilateral is distorted and also the triangle is rigid (दृढ).

Structure like electric tower make use of triangular shape, so they could be distorted and could be rigid.

Remember: →

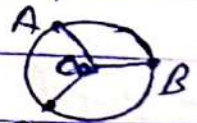
(i) CIRCLE (वृत्त) → A closed rounded plane figure or shape is called circle.



(ii) CIRCUMFERENCE (वृत्तपरिधि) → ~~The long bound~~ The boundary line of the circle is called circumference.

(iii) CENTRE (केंद्र) → A fixed point inside the circle from where all the points lies on its circumference is at equal distance. This fixed point is called centre.

O is the centre (such that $OA = OB = OC$).

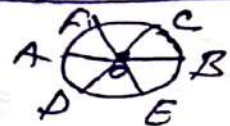


(iv) RADIUS (वृत्तार्ध) The line segment meeting any point lies on the circumference ~~to the~~ with centre is called radius. It is denoted by r . $OA = OB = OC = r$ $r = \frac{d}{2}$

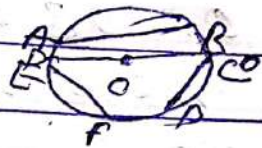
(v) DIAMETER (वृत्तसिद्धि) → A line passing through its centre joining any two points on the circle is called diameter.

AB, CD, ED are diameters

It is denoted by d $d = 2 \times r$

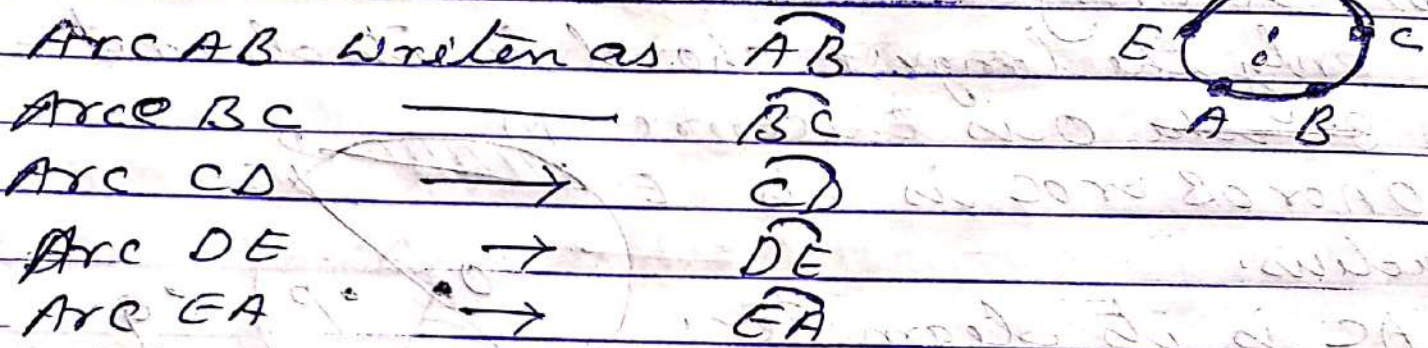


(vi) CHORD (जोड़ = जीवा या चापकर्म) : \rightarrow A line segment joining any two points on the circle is called chord.
 Diameter is the longest chord.

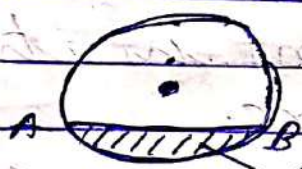


AB, CD, EF and PQ are chords.

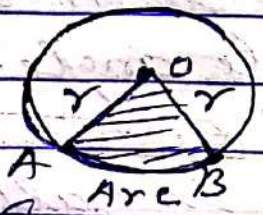
(vii) ~~SECTOR~~ ARC (चाप) \rightarrow The piece of circumference of a circle is called arc.



(viii) SEGMENT (खण्ड) \rightarrow A region (क्षेत्र) in the interior of the circle enclosed by an arc and a chord is called segment.

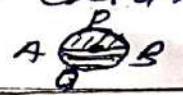


(ix) SECTOR (त्रिज्याखंड) \rightarrow A region in the interior of the circle enclosed by an arc and a two radii (द्विज्याया = त्रिज्याखंड).



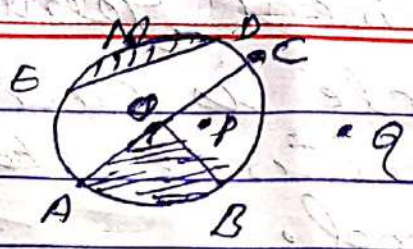
Region AOB (shaded) is a sector AOB.

(x) SEMI CIRCLE (अर्धचंद्र) \rightarrow The two halves parts of a circle divided by diameter are called semi circle.
 APB and AQB are semi circles.



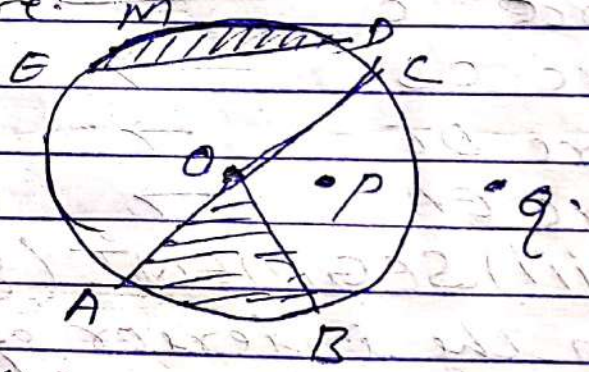
EXERCISE - 4.6.

1. (a) O is the centre.
 (b) OA, OB and OC.
 (c) AC is a diameter.
 (d) DE is a chord.
 (e) P and O.



- (f) point Q. (g) sector OAB (h) segment ~~EMD~~ BMD
 (2) (a) Yes, every diameter is also a chord.
 (b) No, every chord is not its diameter.
 - only the longest chord is its diameter.

3. (a) ~~Q~~ O is the centre.
 (b) OA or OB or OC is its radius.



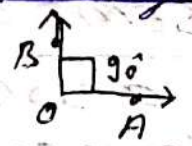
- (c) AC is its diameter.
 (d) OAB is a sector.
 (e) EMD is a segment.
 (f) P is the point in its interior.
 (g) Q is the point in its exterior.
 (h) DE is an arc.

4. (a) T (b) T

CHAPTER - 5

KINDS OF ANGLE

- (i) ACUTE ANGLE (अकूट कोण) → An angle whose measure is greater than 0° but less than 90° is called acute angle. Ex - $5^\circ, 20^\circ, 80^\circ, 89^\circ$
 (ii) RIGHT ANGLE (समकोण) → An angle whose measure is 90° is called right angle.



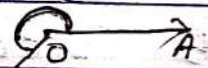
(iii) OBTUSE ANGLE (अधिक कोण) :- \rightarrow An angle whose measurement is greater than 90° but less than 180° is called obtuse angle.
 Ex - $91^\circ, 100^\circ, 120^\circ, 170^\circ, 179^\circ$ etc.



(iv) STRAIGHT ANGLE (सहस्र कोण या सरल रेखा कोण) \rightarrow An angle of measure 180° is called straight angle.



(v) REFLEX ANGLE (पुनर्पुन कोण) \rightarrow An angle whose measure is greater than 180° but less than 360° is called reflex angle.
 Ex - $200^\circ, 330^\circ, 350^\circ$ etc.



(vi) COMPLETE ANGLE (पूर्ण कोण) \rightarrow An angle of measure 360° is called complete angle.

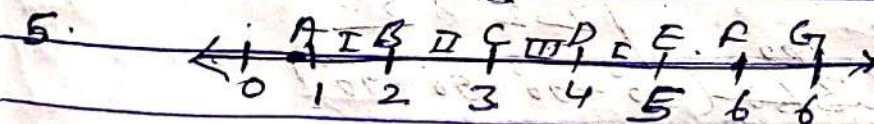
~~XXXXXXXXXXXX~~

EXERCISE - 5.1

- Ans - It may be error by mere observation.
- Because divider gives accurate ^{measure} ~~rule~~ than a ruler.

3. Yes, $AB = AC + CB$.

4. $5 + 3 = 8 \text{ cm} \Rightarrow AB + BC = AC$
 We see that B lies between A and C.



A से D के बीच = I, II, III (3 parts) $\therefore AD = 3 \text{ units}$
 D से G = DG = 3 units. $\therefore AD = DG = 3 \text{ units}$
 \therefore We can say that D is the midpoint of AG.
 Verified

⑥ Yes, Because,



\therefore B is the mid point (मध्यबिंदु) of AC

$\therefore AB = BC$ — (i)

Again \because C is the mid point of BD

$\therefore BC = CD$ — (ii)

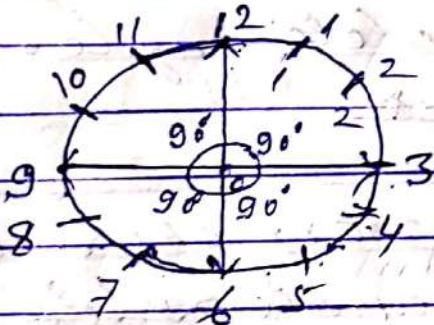
from (i) and (ii) $AB = BC = CD \Rightarrow AB = CD$

⑦ NO, the sum of the length of the two sides of a triangle is never less than the third side. — x —

Exercise-5.2

⑧ Clockwise = घड़ी की सुई की दिशा में (दाहिना घूर्णन)

Anticlockwise = घड़ी की सुई की विपरीत दिशा में (बायाँ घूर्णन)



10. (a) 3 10 9 व 3 से 9 तक जाते हैं

कुल 6 भागों (3 से 4, 4 से 5, 5 से 6, 6 से 7, 7 से 8, तथा 8 से 9) को पार करना पड़ता है

तथा घड़ी पर कुल भागों की संख्या = 12

\therefore Required fraction = $\frac{\text{पार किए गए भागों की संख्या}}{\text{घड़ी के कुल भाग}}$

$= \frac{6}{12} = \frac{1}{2}$


$= \frac{1}{2}$ or $\frac{1}{2} \times 360^\circ (90^\circ + 90^\circ + 90^\circ + 90^\circ)$

$= \frac{1}{2}$ or $180^\circ = \frac{1}{2}$ or two right angles

1(b) 4 TO 7; total no. of parts at a clock = 12
 Total no. of parts covered by needle of clock
 = 7 - 4 = 3. hand.

\therefore fraction = $\frac{3}{12} = \frac{1}{4}$ or $\frac{1}{4} \times 360^\circ$
 $= \frac{1}{4}$ or 90°
 $= \frac{1}{4}$ or one right angle

(c), (d), (e), (f) \rightarrow कचं वनातं (a) से समकोण अथ
 (b) की वरु वनातं

2. $\frac{1}{2}$ of revolution =  [\because 1 Revolution = 360° or 12 hours.
 $= \frac{1}{2} \times 12$ hours = 6 hours.

\therefore 6 hours of 12 o'clock = ~~6 o'clock~~
 $= 6$ o'clock. (12 घंटे में 6 घंटाओं परनामत)

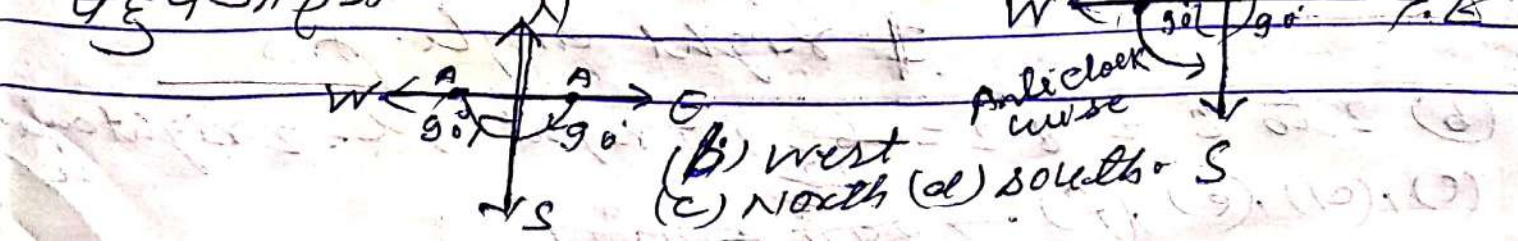
\therefore The hand of a clock stops at 6 Ans

(b) $\frac{1}{2}$ of revolution = $\frac{1}{2} \times 12 = 6$ hours

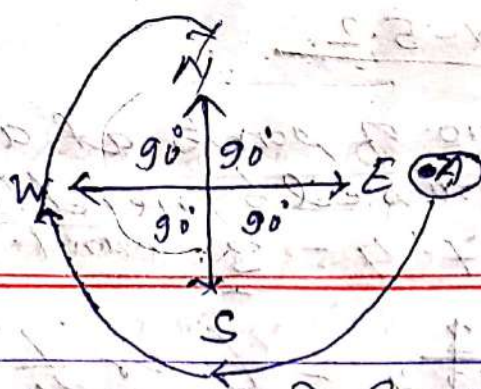
The hand of the clock starts from 2 stops at $2 + 6 = 8$ Ans

(c), (d) \rightarrow a or b की वरु वनातं

3. $\frac{1}{2}$ of revolution = $\frac{1}{2} \times 360^\circ = 180^\circ$
 (a) पूर्व East (दूरव की ओर मुँह करके
 दक्कन में दक्कन 180° घुमाने पर west
 पहुँच जायेंगे)



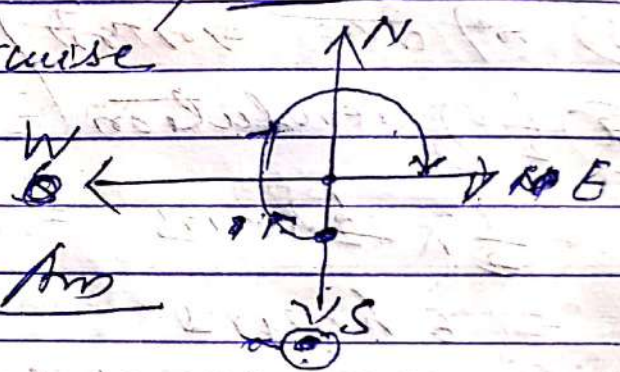
4. (a)



East से North पर जाने के लिए उसे ~~एक~~ भागों में ~~दो~~ 3 भाग पार करना पड़ेगा ~~है~~।
 ∴ part of revolution = 3 भाग पार किया

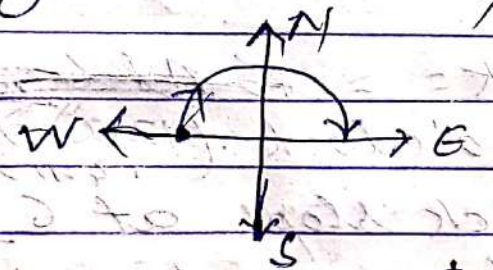
= $\frac{3}{4}$ Ans

(b) (यहाँ पर South से clockwise East पर जाने में चार भागों में से 3 भाग पार करना पड़ेगा)



∴ part of revolution = $\frac{3}{4}$ Ans

(c)



part of revolution = $\frac{1}{2}$ = $\frac{1}{2}$ Ans

5. (a) 3 to 6
 Q. NO - (d) (e) (f) →

Total number of crossed part in 3 tab = 6 - 3 = 3 part.

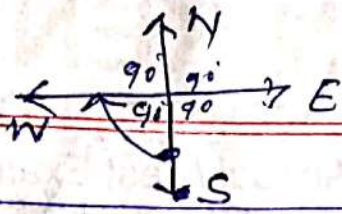
fraction = $\frac{3}{12} = \frac{1}{4}$ × 4 right angle
 = 1 × 1 right angle
 = 1 right angle. Ans

∴ 1 revolution = 360° = 4 right angle

(b) 2 to 8 = 8 - 2 = $\frac{6}{12}$ × 2 right angle = 2 right angle

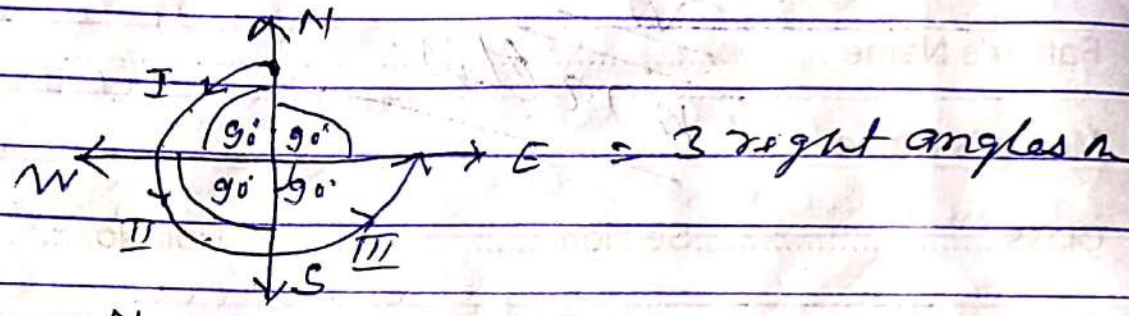
(c), (d), (e), (f) → स्वयं बनाऊँ

6 (a)

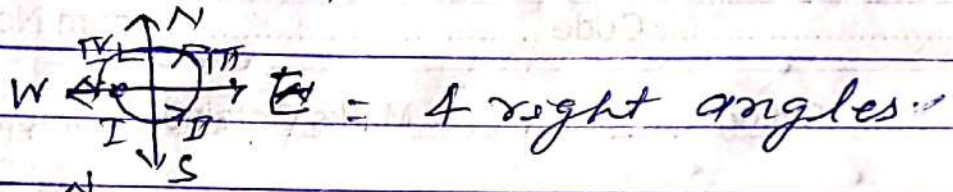


= one right angle Ans

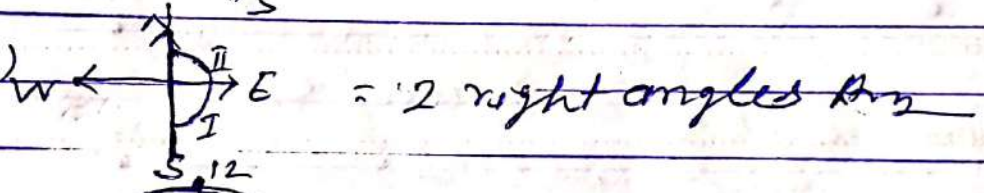
(b)



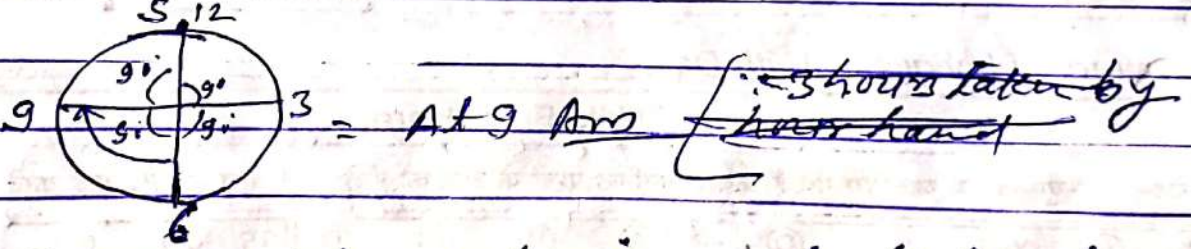
(c)



(d)



7 (a)



(b) ~~1~~ ~~right~~ ~~angle~~ is made by hour hand in 3 hours.

∴ 2 right angle is made in $3 \times 2 = 6$ hours.

∴ The hour hand ~~stop~~ will stop at $= 8 + 6 = 14 - 12 = \text{At } 2 \text{ Am}$

(c) ∴ 1 right angle = 3 hours.

∴ 3 right angle = $3 \times 3 = 9$ hours.

∴ The hour hand will stop at $= 10 + 9 = 19 - 12 = \text{at } 7 \text{ Am}$

(d) \therefore 1 straight angle = 360°
 \therefore 2 straight angle = $2 \times 360^\circ = 720^\circ = \frac{720^\circ}{90}$
 \therefore ~~900~~ (right angle) = 3 hours = 8 right
 8 right angles = $3 \times 8 = 24$ hours =
 $= 24 - 12 = 12 - 12 = 0 + 7 = 7$
 = At 7 Am

EXERCISE - 5.3

Remember \rightarrow 1 Revolution = 360° .
 (1) (i) \rightarrow (c) (2) (a) acute angle (b) obtuse
 (ii) \rightarrow (d) (c) right angle (d) Reflex angle
 (iii) \rightarrow (a) (e) straight angle (f) Acute angle
 (iv) \rightarrow (c) (b)
 (v) \rightarrow (b).

EXERCISE - 5.4

(1) (a) 90° Am (ii) 180° Am
 (2) (a) T (b) F (c) T (d) T
 (3) $\therefore 53^\circ > 35^\circ$
 $\therefore m\angle A > m\angle B$ True
 3. (a) $30^\circ, 50^\circ$ (b) $100^\circ, 105^\circ$
 4. ~~the~~ protractor (साँच) से मापकर पढ़ें।
 5. $\angle B > \angle A$ Am (साँच से मापकर पढ़ें।)
 (6) second angle is larger. n
 (7) (a) acute angle (b) obtuse angle
 (c) 2 right angle = $2 \times 90^\circ = 180^\circ$ (straight angle)
 (d) acute angle (e) obtuse angle.

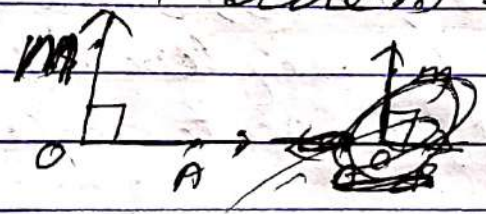
(8) स्वयं चाँद (protractor) से माप कर लें।

(9) (a) 90° (b) $\frac{360^\circ}{12} = 30^\circ$ (c) 180° Ans

(10) NO, it will be same.

(11) मापें तथा measure वाले खाते से दोनो नया Type से वह माप कोण किस प्रकार (acute, obtuse ---) करते, इसे रेखांकन है

PERPENDICULAR LINES \rightarrow Two lines are said to be perpendicular (1) to each other when the measure the angle between them is 90° . such that

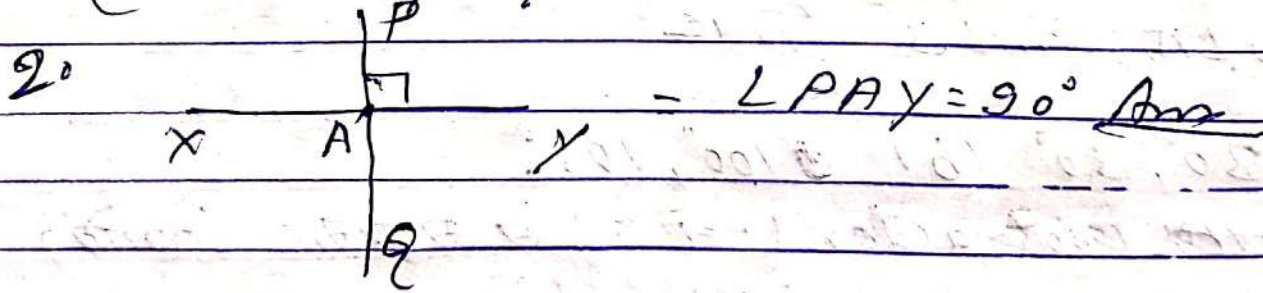


$\angle AOM = \angle BOM = 90^\circ$

\therefore we can say that OM perpendicular to AB
 written as $OM \perp AB$
~~or $AB \perp OM$ or $OA \perp OM$.~~

Exercise- 5.5

1. (a) perpendicular (b) NO (c) perpendicular (d) not perpendicular.



3. one set square has angle of measure $90^\circ, 30^\circ$ and 60° .

Second set square has $90^\circ, 45^\circ, 45^\circ$. We see that common angle is 90° Ans

$$4. \textcircled{a} CE = 5 - 3 = 2, EG = 7 - 5 = 2$$

\therefore Yes $CE = EG$ Ans

(b) Yes because $CE = EG$.

(c) PE is perpendicular bisector of DF and CG.

$$(d) \textcircled{ii} AC = 3 - 1 = 2, FG = 7 - 6 = 1$$

$\therefore AC > FG$, True. Ans

$$(ii) CD = 4 - 3 = 1, GH = 8 - 7 = 1$$

$\therefore CD = GH$, True. Ans

$$(iii) BE = 3 - 2 = 1, EH = 8 - 5 = 3$$

$1 < 3$
 $= BE < EH$ True Ans

TYPES

प्रकार के: - OR KINDS OF TRIANGLE BASED ON ANGLES (कोणों के आधार पर \triangle के प्रकार)

(i) ACUTE TRIANGLED (समकोण त्रिभुज) \rightarrow

~~if each angle of a triangle is acute~~
if less than 90° is call A triangle whose all the angles are acute or less than 90° is called acute angle.



(ii) OBTUSE TRIANGLED (समकोण त्रिभुज) \rightarrow

A triangle whose one angle is greater than 90° is called obtuse angle.

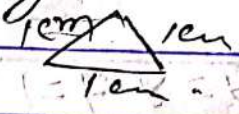


(iii) RIGHT ANGLED TRIANGLE (समकोण Δ) \rightarrow
 A triangle whose one angle is a right angle or 90° is called right angled triangle.

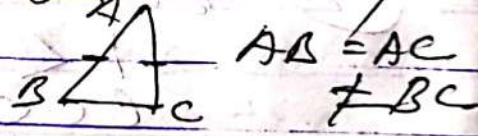


TYPES OF TRIANGLE ON THE BASIS OF SIDES (भुजा के आधार पर त्रिभुजों के प्रकार)

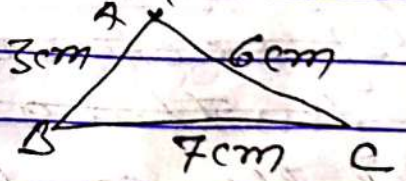
(i) EQUILATERAL TRIANGLE (समबाहु Δ) \rightarrow
 A triangle whose all three sides are equal in length, is called equilateral triangle.



(ii) ISOSCELES TRIANGLE (समबाहु त्रिभुज) = Isosceles triangle \rightarrow A triangle whose any two sides are equal is called isosceles triangle.



(iii) SCALENE TRIANGLE (सकलान त्रिभुज) = Scalene triangle \rightarrow A triangle whose all three sides are not equal is called scalene triangle.



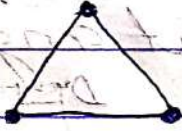
EXERCISE-5.6

- (1) (a) scalene triangle (b) scalene triangle
- (c) Equilateral triangle (d) Right angled triangle
- (e) Isosceles right angled triangle
- (f) Acute angled triangle.

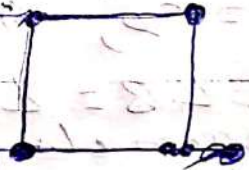
② (i) \rightarrow e, (ii) \rightarrow g, (iii) \rightarrow a, (iv) \rightarrow f, (v) \rightarrow d,
 (vi) \rightarrow c, (vii) \rightarrow b.

3. (a) Isosceles triangle and acute angled Δ .
 (b) Right angled Δ and scalene Δ .
 (c) Obtuse angled Δ and Isosceles Δ .
 (d) Right angled and Isosceles Δ .
 (e) Equilateral Δ and acute angled Δ .
 (f) obtuse angled Δ and scalene Δ .

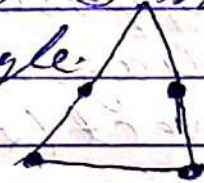
4. (a) Acute angled triangle and equilateral



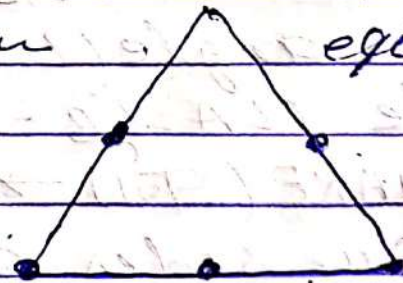
(b) we cannot make a triangle.
 we can make a square
 with 4 match sticks.



(c) we can make a Δ with 5 match sticks. It is an acute angle.



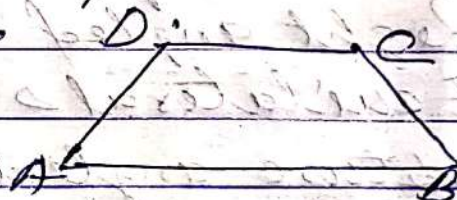
(d) we can make an equilateral triangle with 6 match sticks.



वैसे चारकोर ले: -

QUADRILATERAL (चतुर्भुज) → A closed figure bounded by four line segments is called quadrilateral.

OR, A polygon which have four sides is called quadrilateral.

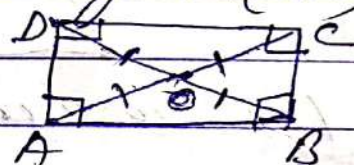


(i) RECTANGLE (आयत) → A quadrilateral which opposite (~~सम~~) sides are equal and ~~each~~ angles ~~is~~ a right angle (90°)

ABCD is a rectangle in which

$AB = CD$, $AD = BC$ and

$\angle A = \angle B = \angle C = \angle D = 90^\circ$ and AC and BD are its diagonals (दिagonal).



PROPERTIES OF A RECTANGLE: -

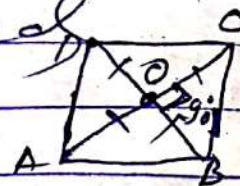
(i) its opposite sides equal.
 (ii) its diagonals (दिagonal) are equal ($AC = BD$) and bisect (आधा करना करना) ~~each~~ each other. $AO = OC = OB = OD = \frac{1}{2} AC = \frac{1}{2} BD$.

(iii) each angle ($\angle A, \angle B, \angle C$ and $\angle D$) is right angle ($\angle A = \angle B = \angle C = \angle D = 90^\circ$)

SQUARE (वर्ग) → A quadrilateral whose all four sides are equal in length and each angle measuring 90° is called square.

ABCD is a square in which

$AB = BC = CD = DA$, $\angle A = \angle B = \angle C = \angle D = 90^\circ$.

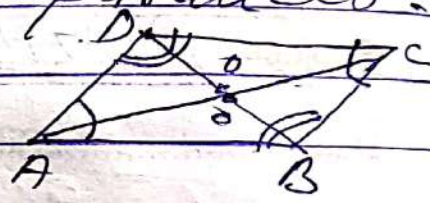


PROPERTIES (गुण) OF A SQUARE →

- (i) its all sides are equal (ii) its diagonals are equal (iii) each angle measuring 90° .
- (iv) diagonals bisect each other at 90° .

3. PARALLELOGRAM (समांतर चतुर्भुज) → A quadrilateral whose opposite sides are parallel and equal is called parallelogram. (॥गम)

AB parallel and equal CD.
 $(AB \parallel = CD)$



$AD \parallel = BC$.

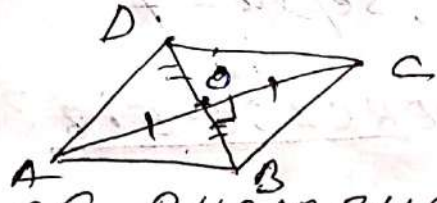
PROPERTIES OF parallelogram →

- (i) The opposite sides are parallel.
- (ii) The opposite sides are equal in length.
- (iii) The opposite angles ($\angle A$ and $\angle C$, or $\angle B$ and $\angle D$) are equal. $\Rightarrow \angle A = \angle C, \angle B = \angle D$.
- (iv) its diagonals bisect each other but they are not equal ($AC \neq BD$).
 i.e. $AO = OC = \frac{1}{2} AC, BO = OD = \frac{1}{2} BD$.

its adjacent (आसन्न) angles sum is 180° i.e. $\angle A + \angle B = \angle C + \angle D = \angle B + \angle C = \angle D + \angle A = 180^\circ$

4. RHOMBUS (समचतुर्भुज) →

A parallelogram whose all four sides are equal. ~~It follows all the properties of a square but its each angle is not measuring 90° .~~ is called Rhombus.

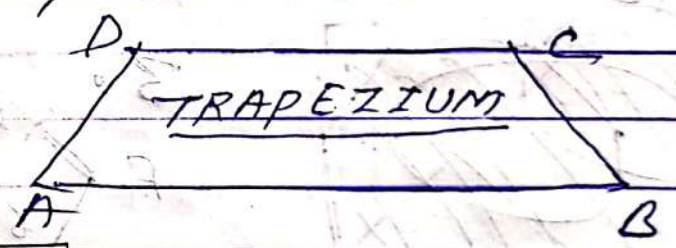


~~5.1~~

- PROPERTIES OF RHOMBUS →
- (i) Its all four sides are equal to each other ($AB = BC = CD = DA$)
 - (ii) Its all the angles not measuring 90° .
 - (iii) Its diagonals (AC and BD) bisect each other at 90° . ($AO = OC = \frac{1}{2} AC$, $OB = OD = \frac{1}{2} BD$).
 - (iv) Its diagonals are not equal in length. (AC is not equal to $BD \Rightarrow AC \neq BD$).

5. TRAPEZIUM (समलयाय चतुर्भुज) → A quadrilateral whose one pair of opposite sides are parallel is called Trapezium.

$AB \parallel CD$, AD and BC are not parallel.



Exercise - 5.7

1. (a) T (b) T (c) T (d) T (e) F (f) F.
2. (a) yes, because its its opposite sides are equal and each angle measuring 90° .
- (b) yes, because its opposite sides are parallel and equal.
- (c) yes, because its all four sides are equal in length and diagonals ~~are~~ bisect each other at 90° .
- (d) yes because all have four sides.
- (e) yes, because its opposite sides are parallel and equal.
3. Yes, it is a regular quadrilateral.

penta = 5, Hexa = 6, Septa = 7
 Octa = 8.

P. NO - 24

EXERCISE-5.8

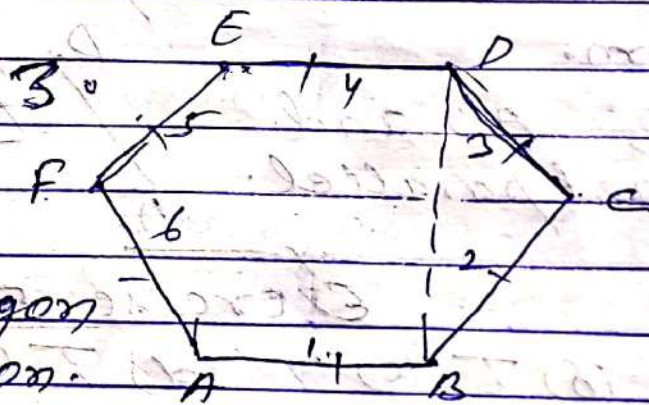
1. ~~It is~~

- (a) It is not polygon because it is not a closed figure.
- (b) It is polygon because it is closed by line segments.
- (c) No, because not made by line segments
- (d) No, made by line segments and curved surface.

2. (a) Quadrilateral (b) Triangle (c) Pentagon
 (d) Octagon

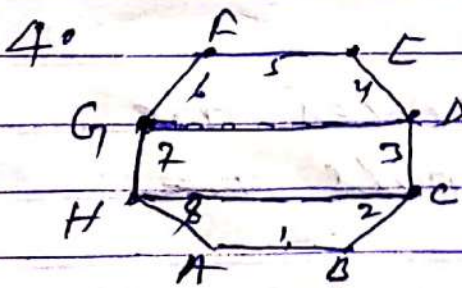


Six sided polygon is called hexagon.



It is a regular hexagon means all its six sides are equal length.

$\triangle BCD$ is isoscles triangle because $BC = CD$.

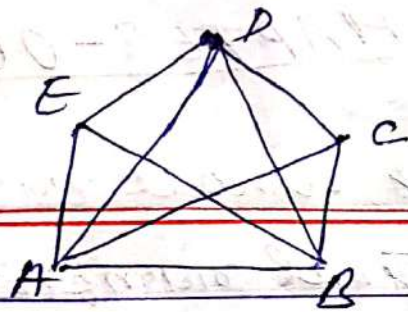


Eight sided polygon is called octagon. These sides are equal in length. So it is called regular octagon.

$G H C D$ is a rectangle.



50




AD, AC, BD, BE are diagonals of pentagon ABCDE.


EX - 5.9

(1) (a) → (ii), (b) → (iv), (c) → (v), (d) → (iii), (e) → (i)

(2) (a) cuboid (b) cuboid (c) cuboid (d) cylinder, (e) sphere.

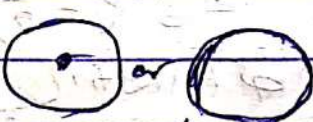
मापकरी


Cuboid → घनाभ → 

cube → घन → 

Cylinder → बेलन → 

cone → शंकु → 

sphere → गोल → 

pyramid → पिरामिड → 

Edge (रज) = किरी / किनारा

face = सतह

Shape	No. of Faces	No. of Edges	No. of Vertices
cuboid/cube	6	12	8
cylinder	3	2	2
cone	2	1	1
sphere	1	0	0
pyramid	4	6	4