

LINES AND ANGLES ①

Class: VI, Mathematics ⑦

SOLUTIONS

TEACHING TASK

01.

$$n = 5, r = 2$$

$$\text{No. of Line Segments} = nC_r = {}^5C_2 = 10$$

Ans: A

02

$$V + F = E + 2$$

$$8 + 6 = E + 2$$

$$\Rightarrow E = 12$$

Ans: A

03

$$4CD - 2AB$$

$$= 4(4.5) - 2(6)$$

$$= 18 - 12$$

$$= 6$$

Ans: D

04

$$\frac{2}{3}AB = \frac{1}{2}BC = 42$$

$$BC = 42 \times \frac{2}{1}$$

$$BC = 12$$

$$AB = 42 \times \frac{3}{2} = 63$$

$$\therefore AB > BC$$

Ans: C

05

$$AB : BC = 3 : 4, BC = 24 \text{ cm}$$

$$BC = \frac{4x}{4} = 24$$

$$\boxed{x = 6}$$

$$AB = 3x$$

$$AB = 3 \times 6 = 18$$

$$\text{We have } AC = AB + BC = 18 + 24 = 42$$

Ans: D

06

$$2BC - CD = 2(4.9) - 4$$

$$= 9.8 - 4$$

$$= 5.8$$

Ans: A

07.

Let the complementary angles be α , $90 - \alpha$

$$\begin{aligned} \alpha: 90 - \alpha &= 7:8 \\ \Rightarrow 8\alpha &= 7(90 - \alpha) \\ \Rightarrow 8\alpha &= 630 - 7\alpha \\ \Rightarrow 15\alpha &= 630 \\ \Rightarrow \alpha &= 42^\circ \end{aligned}$$

$$\alpha = 42^\circ$$

$$\begin{aligned} 90^\circ - \alpha &= 90 - 42^\circ \\ &= 48^\circ \end{aligned}$$

$$\begin{array}{r} 90 \\ - 42 \\ \hline 48 \end{array}$$

(2)

Ans: C

08 Let the two Supplementary angles be $\alpha, 180^\circ - \alpha$

$$\begin{aligned} \alpha: 180^\circ - \alpha &= 4:5 \\ 5\alpha &= 4(180^\circ - \alpha) \\ 5\alpha &= 4 \times 180^\circ - 4\alpha \\ \Rightarrow 9\alpha &= 4 \times 180^\circ \\ \Rightarrow \alpha &= 80^\circ \end{aligned}$$

$$\begin{aligned} 180^\circ - \alpha &= 180^\circ - 80^\circ \\ &= 100^\circ \end{aligned}$$

$\therefore$ The angles are $80^\circ, 100^\circ$

Ans: C

$$\begin{aligned} 09 \quad x^\circ + (2x - 21)^\circ &= 180^\circ \\ 3x &= 201^\circ \\ x &= 67^\circ \end{aligned}$$

$$\begin{array}{r} 180 \\ - 21 \\ \hline 201 \end{array}$$

Ans: B

$$\begin{aligned} 10. \quad x &= 35^\circ, \quad y = 4 \times 35^\circ = 140^\circ, \quad z = 105^\circ \\ x + y + z &= 35^\circ + 140^\circ + 105^\circ \\ &= 280^\circ \end{aligned}$$

Ans: D

$$\begin{aligned} 11. \quad \angle ABC &= \frac{360^\circ}{6} = 60^\circ & : \angle B + \angle C &= 150^\circ \\ \angle PQR &= \frac{360^\circ}{4} = 90^\circ \end{aligned}$$

Ans: B, D

12.

12. Statement I: Let the angles be $\alpha, 180^\circ - \alpha$

(3)

According to the problem

$$\alpha = 2(180^\circ - \alpha) - 30^\circ$$

$$\Rightarrow \alpha = 360^\circ - 2\alpha - 30^\circ$$

$$\Rightarrow 3\alpha = 330^\circ$$

$$\Rightarrow \alpha = 110^\circ$$

$$\therefore 180^\circ - \alpha = 180^\circ - 110^\circ = 70^\circ \text{ (True)}$$

Ans

Statement II: Conceptual (True)

Ans: A

13. Statement I: $n = 4$.

$$\text{No. of Line segments} = \frac{n(n-1)}{2} = \frac{4 \times 3}{2} = 6.$$

Statement II: Conceptual (True)

Ans: A

14 $\angle BCD = 40^\circ + 30^\circ = 70^\circ$

Ans: C

15 $\angle BCA + \angle BCD = 180^\circ - (30^\circ + 40^\circ) = 180^\circ$

Ans D

16 $3x + 40^\circ + x - 20^\circ = 180^\circ$

$$\Rightarrow 4x + 20 = 180^\circ$$

$$\Rightarrow 4x = 160^\circ$$

$$\Rightarrow x = 40^\circ$$

Ans: 40°

17 $AB = 35 \times \frac{2}{5} \Rightarrow AB = 14 \text{ cm}$

18 a) $1 \text{ mm} = \frac{1}{1000} \text{ m}$ b) $1 \text{ dm} = \frac{1}{10} \text{ m}$

c) $1 \text{ decm} = \frac{1}{10} \text{ m}$ d) $1 \text{ Km} = 1000 \text{ m}$

Ans: s, r, r, t



19

a) Acute angle $\rightarrow 89^\circ$ or 70° b) obtuse angle $\rightarrow 91^\circ$ ~~or 100°~~ c) Reflex angle $\rightarrow 181^\circ$ d) right angle $\rightarrow 90^\circ$

Ans: (s, t), p, q, r

(4)

LEARNER'S TASKQ1 Q2'S

01. $V + F = E + 2$

Ans: A

02. same point

Ans: C

03. Congruent segments

Ans: A

04. No. of line segments = 10

No. of vertices = 5

Formula = $\frac{n(n-1)}{2} = \frac{5 \times 4}{2} = 10$

Ans: C

05. Conceptual

Ans: A

06. Conceptual

Ans: B

07. Conceptual

Ans: A

08. Conceptual

Ans: D

09. $2^\circ + x = 90^\circ \Rightarrow x = 88^\circ$

Ans: B

10. $178^\circ + x = 180^\circ \Rightarrow x = 2^\circ$

Ans: B

JEE MAINS LEVEL

01. $\begin{array}{l|l} \angle A + \angle B = 180^\circ & \angle A = 50^\circ \\ \angle A + 130^\circ = 180^\circ & \end{array}$

Ans: C



02 $CD = 2x + 5 = 13$

(5)

$\Rightarrow x = 4$

$$\begin{aligned} AB + CD + DA &= x + 10 + 2x + 5 + 5x + 20 \\ &= 8x + 35 \\ &= 8(4) + 35 \\ &= 67 \end{aligned}$$

Ans: A

03 $3AB - CD = 3(6) - 4.5$
 $= 18 - 4.5$
 $= 13.5$

Ans: D

04 $x + 41^\circ = 90^\circ \Rightarrow x = 49^\circ$

Ans: C

05 $(23^\circ, 67^\circ)$

Ans: A

06. $181^\circ, 279^\circ$

Ans: C

07 $\angle A = \frac{18}{72} \times \frac{5}{4}$ | Now $\frac{2}{3}(90^\circ) + 132^\circ$
 $\angle A = 90^\circ$ | $= 60^\circ + 132^\circ$
 $= 192^\circ$

Now $360^\circ - 192^\circ = 168^\circ$

Ans: D

08 $(50^\circ, 40^\circ)$

Ans: C

09 $a = 90^\circ - 25^\circ$ | $b = 90^\circ - 65^\circ$
 $= 65^\circ$ | $= 25^\circ$

Ans: A

10. $(x + 10^\circ) + (x + 40^\circ) = 90^\circ$
 $\Rightarrow 2x = 40^\circ$
 $\Rightarrow x = 20^\circ$

$x + 10^\circ = 20^\circ + 10^\circ = 30^\circ$
 $x + 40^\circ = 20^\circ + 40^\circ = 60^\circ$

Ans: D



12. Statement I: $x = 50^\circ$, $y = 150^\circ$, $z = 160^\circ$

$$\text{Now } x + y + z = 50^\circ + 150^\circ + 160^\circ \\ = 360^\circ \quad (\text{True})$$

$$\begin{array}{r} 135 \\ 21 \\ \hline 0 \end{array}$$

Statement II: Conceptual (True)

13.

$$AB = 19.6 \times \frac{7}{4} = 4.9 \times 7 = 34.3$$

$$BC = 37.9 - 12.4 = 25.5$$

$$CD = 30.1 + 4.6 = 34.7$$

$$DE = 2.7 \times 8 = 21.6$$

$$\text{Now } AB + BC + CD - x = DE$$

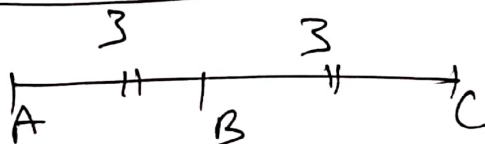
$$34.3 + 25.5 + 34.7 - x = 21.6$$

$$x = 72.9$$

$$\begin{array}{r} 6 \\ 37.9 \\ 12.4 \\ \hline 25.5 \\ 27.5 \\ \times 8 \\ \hline 21.6 \end{array}$$

Ans: A

14.



$$AC = 3 + 3 = 6 \text{ cm}$$

Ans: C

15 a) Complement of x

b) straight angle

c) complete angle

d) Supplement of x

Ans: x, s, p, z

$\Rightarrow$ THE END $\Leftarrow$