

Class: 9
Subject: Mathematics
Topic: Lines and angles
No. of Questions: 20
Duration: 60 Min
Maximum Marks: 60

Q1. In fig. 6.1, if $AB \parallel CD \parallel EF, PQ \parallel RS$, $\angle RQD = 25^\circ$ and $\angle CQP = 60^\circ$, then $\angle QRS$ is equal to

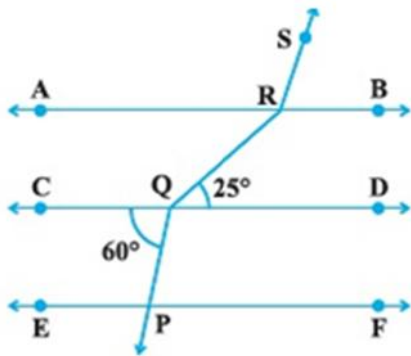
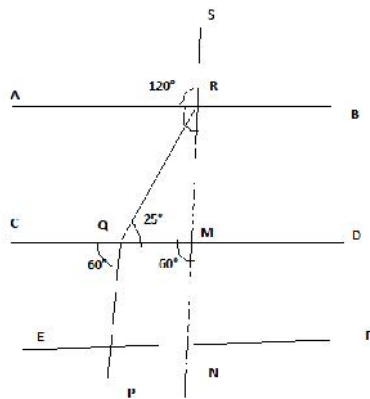


Fig. 6.1

- a. 85°
- b. 135°
- c. 145°
- d. 110°

Ans:c



$$\angle CMN = \angle CQP = 60^\circ$$

$$\therefore \angle ARM = \angle CQP \text{ (Corresponding angles)}$$

$$\angle SRA = 120^\circ$$

$$\angle ARQ = \angle RQD = 25^\circ \text{ (Corresponding angles)}$$

$$\therefore \angle QRS = 120 + 25 = 145^\circ$$

Q2. If one angle of a triangle is equal to the sum of the other two angles, then the triangle is

- a. An isosceles triangle
- b. An obtuse triangle
- c. An equilateral triangle
- d. A right triangle

Ans:d

$$\angle A + \angle B + \angle C = 180^\circ$$

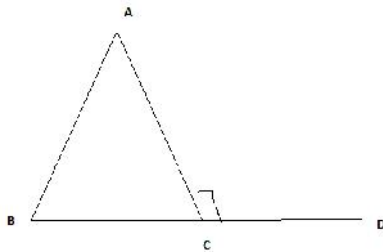
$$\angle A = \angle B + \angle C$$

$$\therefore \angle A = \frac{180}{2} = 90^\circ$$

Q3. An exterior angle of a triangle is 105° and its two interior opposite angles are equal, Each of these equal angles is

- a. $34\frac{1}{2}^\circ$
- b. $52\frac{1}{2}^\circ$
- c. $72\frac{1}{2}^\circ$
- d. 75°

Ans:B



Exterior angle equal to sum of interior angles

$$\angle ACD = \angle ABC + \angle BAC$$

$$105^\circ = 2\angle ABC$$

$$\angle ABC = 52.5^\circ$$

Q4. The angles of triangle are in the ratio 5 : 3 : 7. The triangle is

- a. An acute angled triangle
- b. An obtuse angled triangle
- c. A right triangle
- d. An isosceles triangle

Ans:a

5 : 3 : 7 Angle Ratio

$$\therefore 5x + 3x + 7x = 180^\circ$$

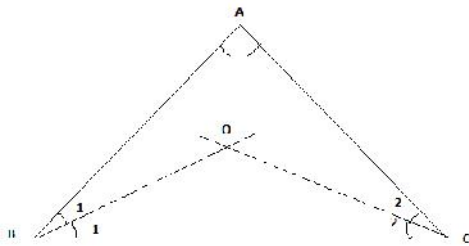
$$15x = 180^\circ$$

$$x = \frac{180}{15} = 12^\circ$$

Angles = $60^\circ, 36^\circ, 84^\circ$

Q5. If one of the angles of a triangle is 130° , then the angle between the bisectors of the other two angles can be

- a. 50°
- b. 65°
- c. 145°
- d. 155°



Ans:d

$$2\angle 1 + 2\angle 2 + 130 = 180^\circ$$

$$\angle 1 + \angle 2 = \frac{50}{2} = 25^\circ$$

$$\begin{aligned} \therefore \angle BOC &= 180 - 25 \\ &= 155^\circ \end{aligned}$$

Q6. All the supplementary angles are Linear Pair.

- a. True
- b. False
- c. Can't Say
- d. None of these

Ans: b

Converse is true but any two angles whose sum is 180 are supplementary whereas it is not necessary that they are linear pair.

Q7. Angles of a triangle are in the ratio 2:4:3. The smallest angle of the triangle is

- a. 60°
- b. 40°
- c. 80°
- d. 20°

Ans.:b

$$2x+3x+4x = 180^\circ$$

$$9x = 180^\circ$$

$$X = 20^\circ$$

$$\text{Smallest Angles} = 40^\circ$$

Paragraph for Q8 and Q9

In Fig . 6.13, lines ab and cd intersect at o. if $\angle AOC + \angle BOE = 70^\circ$ and $\angle BOD = 40^\circ$.

Q8. Find $\angle BOE$

- a. 300
- b. 500
- c. 1100
- d. 2500

Sol: a

Q9. Find reflex $\angle COE$.

- a. 30°
- b. 50°
- c. 110°
- d. 250°

Sol: d

Sol: 8 to 9

Sol: AB is a straight line and rays OC and OE meets at point O on AB.

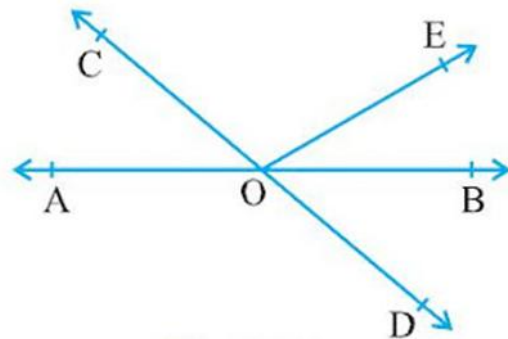


Fig. 6.13

$$\angle AOC + \angle COE + \angle BOE = 180^\circ$$

$$\Rightarrow 70^\circ + \angle COE = 180^\circ \quad (:\angle AOC + \angle BOE = 70^\circ, \text{ Given})$$

$$\Rightarrow \angle COE = 180^\circ - 70^\circ = 110^\circ$$

$$\text{Reflex } \angle COE = 360^\circ - 110^\circ = 250^\circ$$

: CD is a straight line and rays OE and OB stand on it.

$$\Rightarrow \angle COE + \angle BOE + \angle BOD = 180^\circ$$

$$\Rightarrow \angle BOE = 180^\circ - (\angle COE + \angle BOD) = 180^\circ - (110^\circ + 40^\circ)$$

$$\Rightarrow \angle BOE = 180^\circ - 150^\circ = 30^\circ$$

Q10. In fig. 6.14 lines xy and mn intersect at. O. if $\angle POY = 90^\circ$ and $a : b = 2:3$, find c

- a. 126°
- b. 50°
- c. 70°
- d. 54°

Sol: a

Sol: Let $\angle POM = a = 2x$ and $\angle XOM = b = 3x$ such that $a:b = 2:3$.

XY is a straight line and rays OM AND OP stand on it.

$$\Rightarrow \angle XOM + \angle POM + \angle POY = 180^\circ$$

$$\Rightarrow b + a + 90^\circ = 180^\circ$$

$$\Rightarrow 3x + 2x = 180^\circ - 90^\circ$$

$$\Rightarrow 5x = 90^\circ$$

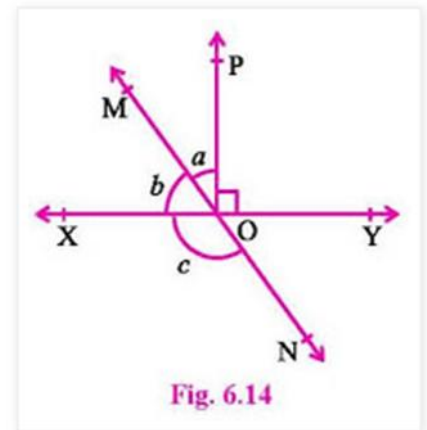
$$\Rightarrow x = 90^\circ / 5 = 18^\circ$$

$$A = 2 \times 18^\circ = 36^\circ \text{ and } b = 3 \times 18^\circ = 54^\circ$$

Since MN is a straight line and XY intersects it. $\angle XOM$ and $\angle XON$ forms a linear pair

$$\Rightarrow \angle XOM + \angle XON = 180^\circ$$

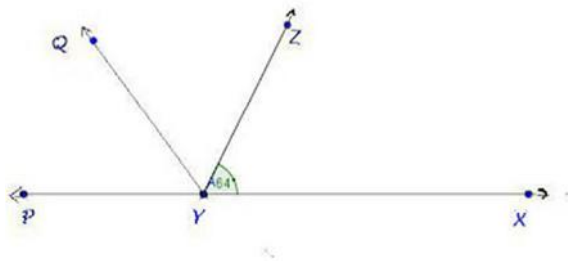
$$\Rightarrow b + c = 180^\circ$$



$$\Rightarrow c = 180^\circ - b = 180^\circ - 54^\circ = 126^\circ$$

Paragraph (Q11-12)

It is given that $\angle XYZ = 64^\circ$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects $\angle ZYP$.



Q11. find $\angle XYQ$

- a. 302°
- b. 122°
- c. 88°
- d. 58°

Sol:b

Q12. find reflex $\angle QYP$.

- a. 302°
- b. 122°
- c. 88°
- d. 58°

Sol: a

Sol:11 to12

YQ bisects $\angle PYZ$

$$\Rightarrow \angle PYQ = \angle QYZ$$

PX is a straight line. Ray QY and ZY stand on it.

$$\Rightarrow \angle PYQ + \angle QYZ + \angle ZYX = 180^\circ$$

$$\Rightarrow 2 \angle PYQ + 64^\circ = 180^\circ$$

$$\Rightarrow 2 \angle PYQ = 180^\circ - 64^\circ = 116^\circ$$

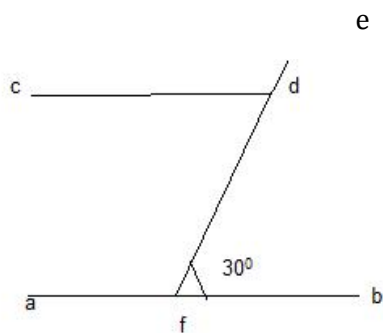
$$\Rightarrow \angle PYQ = 116^\circ / 2 = 58^\circ$$

$$\angle PYQ = \angle QYZ = 58^\circ$$

$$\angle XYQ = \angle QYZ + \angle ZXY = 58^\circ + 64^\circ = 122^\circ$$

$$\text{Reflex } \angle QYP = 360^\circ - \angle QYP = 360^\circ - 58^\circ = 302^\circ$$

Q13. In the figure, $AB \parallel CD$ and $\angle F = 30^\circ$ Find $\angle CDE$.



- a. 150°
- b. 170°
- c. 30°
- d. 60°

Sol: a

$$\angle CDF = 30^\circ$$

All interior angles

$$\text{lines pair } \angle CDF + \angle CDE = 180^\circ$$

$$\angle CDE = 150^\circ$$

Q14. Find the measure of an angle, if seven times its complement is 10 less than three times its supplement.

- a. 20°
- b. 25°
- c. 35°
- d. 50°

Sol: b

Let the angle be x

Complement = $(90-x)$

Supplement = $(180-x)$

$$3(180-x) - 10 = 7(90-x)$$

$$540 - 3x - 10 = 630 - 7x$$

$$4x = 640 - 540$$

$$4x = 100$$

$$x = \frac{100}{4} = 25^\circ$$

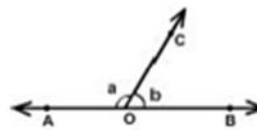
Paragraph (Q15-16)

In the given figure, $\angle AOC$ and $\angle BOC$ form a linear pair. If $a - b = 80$

Q15. find the value of a

- a. 150°
- b. 130°
- c. 80°
- d. 50°

Sol b



Q16. Find the value of b

- a. 150°
- b. 130°
- c. 80°
- d. 50°

Sol d

Sol 15 and 16

$a+b=180$ (Linear pair)

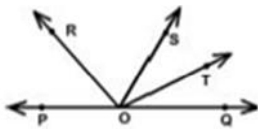
$a-b = 80$

adding both equations

$a = 260/2 = 130$

$b = 50$ $a=130$ $a=130$

Q17. In the figure, ray OS stands on a line POG. Rays OR and OT are the angle bisectors of $\angle POS$ and $\angle SOQ$ respectively. Find the value of $\angle ROT$



- a. 30°
- b. 80°
- c. 50°
- d. 90°

Sol: d

$$2a+2b = 180$$

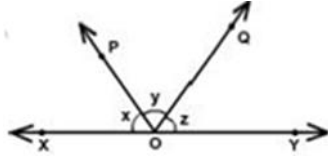
$$A+b = \frac{180}{2}$$

$$a+b = 90^\circ$$

$$\angle ROT = 90^\circ$$

Paragraph (Q18-20)

In the given figure, $x:y:z = 5:4:6$. If XOY is a straight line



Q18. find the values of x

- a. 12°
- b. 60°
- c. 48°
- d. 72°

Sol: b

Q19. find the values of y

- a. 12°
- b. 60°
- c. 48°
- d. 72°

Sol: c

Q20. find the values of z

- a. 12°
- b. 60°
- c. 48°
- d. 72°

Sol: d

Sol: 17 - 20

$$x+y+z = 180$$

$$\text{But } \frac{x}{5} = \frac{y}{4} = \frac{z}{6} = k$$

$$x = 5k$$

$$x = 60^\circ$$

$$y = 4k$$

$$y = 48^\circ$$

$$z = 6k$$

$$z = 72^\circ$$

$$15k = 180$$

$$K = 12$$

askIITians