Board – CBSE	Class – 7th	Topic – Constructions

Q.1 The supplement of 45° is

Ans: Supplement of $45° = 180° - 45°$

$= 135°$

Q.2 The complement of 80° is

Ans: Complement of $80° = 90° - 80°$

$= 10°$

Q.3 An angle is its own complement. The measure of the angle is

Ans: Suppose the angle is $x°$.

Then, the complement is also $x°$.

Complement of $x° = 90° - x°$

$\Rightarrow x° = 90° - x°$

$\Rightarrow x° + x° = 90°$

$\Rightarrow x = \frac{90}{2}$

$\Rightarrow x = 45$

Q.3 Two supplementary angles are in the ratio 3 : 2. The smaller angle measures

Ans: Supplementary angles:

$3x + 2x = 180$

$\Rightarrow x = \frac{180}{5}$

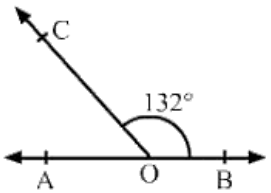
$\Rightarrow x = 36°$

Smaller angle $= (2 \times 36°)$

$= 72°$

Q.4 In the given figure, AOB is a straight line and the ray OC stands on it.

If $\angle BOC = 132°$, then $\angle AOC = ?$



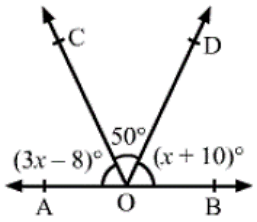
Ans: $\angle AOC + \angle BOC = 180°$ (linear pair)

$\angle AOC = 180° - \angle BOC$

$=180°-132°$

$=48°$

Q.5 In the given figure, AOB is a straight line, $\angle AOC = (13x - 8)°$, $\angle COD = 50°$ and $\angle BOD = (x + 10)°$. The value of x is



Ans: $(3x - 8)° + (x + 10)° + 50° = 180°$ (linear pair)

$\Rightarrow 4x° + 52° = 180°$

$\Rightarrow 4x° = 128°$

$\Rightarrow x° = 32°$

$\therefore x = 32$

Q.6 The angles of a triangle are in the ratio 2 : 3 : 7. The measure of the largest angle is

Ans: Suppose the angles of a triangle are 2x, 3x and 7x.

Sum of the angles of a triangle is 180°.

$2x + 3x + 7x = 180$

$\Rightarrow 12x = 180$

$\Rightarrow x = 15°$

Measure of the largest angle $= 15° \times 7 = 105°$

Q.7 In a ΔABC, if $2\angle A = 3\angle B = 6\angle C$, then $\angle B$ =?

Ans: $2\angle A = 3\angle B \ or \ \angle A = \frac{3}{2}\angle B$

$3\angle B = 6\angle C, \ or \ \angle C = \frac{1}{2}\angle B$

In a ΔABC :

$\angle A + \angle B + \angle C = 180°$

$\Rightarrow \frac{3}{2}\angle B + \angle B + \frac{1}{2}\angle B = 180°$

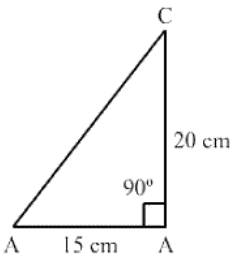
$\Rightarrow \frac{3\angle B + 2\angle B + \angle B}{2} = 180°$

$\Rightarrow \frac{6\angle B}{2} = 180°$

$\Rightarrow \angle B = \frac{360°}{6}$

$\Rightarrow \angle B = 60°$

Q.8 A ladder is placed in such a way that its foot is 15 m away from the wall and its top reaches a window 20 m above the ground. The length of the ladder is



Ans: In a right angle triangle ABC:

$AC^2 = AB^2 + BC^2$

$= 15^2 = 20^2$

$\Rightarrow AC^2 = 625$

$\Rightarrow AC = \pm 25$

Since the length cannot be negative, we will neglect -25.

$\therefore Length\ of\ the\ ladder\ = 25\ m$

Q.9 Two poles of heights 6 m and 11 m stand vertically on a plane ground. If the distance between their feet is 12 m, what is the distance between their tops?

Ans: Suppose there are two poles AE and BD.

$EC = AB = 12\ m$ (ABCE is a rectangle)

$AE = BC = 6\ m$ (ABCE is a rectangle)

$DC = BD - AE$

$= 11 - 6$

$= 5\ m$

In the right angled triangle ECD :

$ED^2 = EC^2 + DC^2$ (Pythagoras theorem)

$ED^2 = 5^2 + 12^2$

$ED^2 = 25 + 144$

$ED^2 = 169$

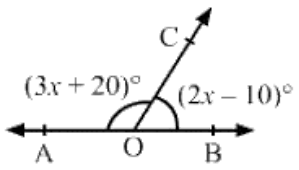
$ED = \pm 13$

The length cannot be negative.

$\therefore ED = 13\ m$

Q.10 In the given figure, AOB is a straight line and OC is ray such that ∠AOC = (3x + 20)° and ∠BOC = (2x − 10)°. Find the value of x and hence find ∠AOC and ∠BOC.

Ans: Here, $3x + 20 + 2x - 10 = 180$



$\Rightarrow 5x + 10 = 180$

$\Rightarrow 5x = 170$

$\Rightarrow x = 34$

$\angle AOC = (3\times 34 + 20)°$

$= (102 + 20)°$

$= 122°$

$\angle BOC = (2\times 34 - 10)°$

$= (68 - 10)°$

$= 58°$

Q.11 Two legs of a right triangle are 8 cm and 15 cm long. Find the length of the hypotenuse of the triangle.

Ans: Since it is a right triangle, by using the Pythagoras theorem:

Length of the hypotenuse= $\sqrt{8^2 + 15^2}$

$= \sqrt{64 + 225}$

$= \sqrt{289}$

$= \pm 17\ cm$

The length of the side cannot be negative.

∴ Length of the hypotenuse=17 cm

Q.12 In a ΔABC, If ∠B = 40° and ∠C = 35°, then ∠A =?

Ans: $\angle A + \angle B + \angle C = 180°$

$\Rightarrow \angle A = 180° - (40° + 35°)$

$\Rightarrow \angle A = 105°$

Q.13 ΔABC is an isosceles right triangle in which ∠A = 90° and BC = 6 cm. Then AB =?

Ans: Here, AB=AC

In right angled isosceles triangle:

$$BC^2 = AB^2 + AC^2$$

$$\Rightarrow BC^2 = 2AB^2$$

$$\Rightarrow 36 = 2AB^2$$

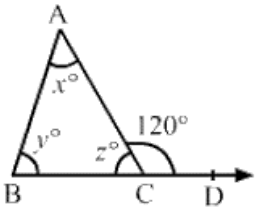
$$\Rightarrow AB^2 = \frac{36}{2}$$

$$\Rightarrow AB = \sqrt{18}$$

$$\Rightarrow AB = 3\sqrt{2}\ cm$$

Q.14 In the given figure, x : y = 2 : 3 and ∠ACD = 120°. Find the values of x, y and z.

Ans: Let $x = 2k\ and\ y = 3k$



$\therefore 2k + 3k = 120°$ (exterior angle property)

$\Rightarrow 5k = 120°$

$\Rightarrow k = 24°$

$\therefore x = 2\times24° = 48°\ \ and\ \ y = 3\times24° = 72°$

In ΔABC :

$\angle A + \angle B + \angle C = 180°$

$\Rightarrow 48° + 72° + \angle C = 180°$

$\Rightarrow \angle C = 180° - 120°$

$\Rightarrow \angle C = 60°$

$\therefore z = 60°$