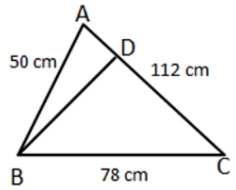
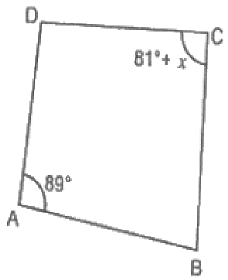
SOLUTIONS

1. (b) on the y-axis
Explanation: In point $(0, -7)$, x – coordinate is zero, so it lies on Y-axis and y-coordinate is negative, so the point (0, – 7) lies on the Y-axis in the negative direction.

2. (c) 30 cm
Explanation:


The smallest altitude ⊥ is drawn to the largest side of a Δ from opposite point.
i.e. BD Area of Δ = $\frac{1}{2} \times AC \times BD = \frac{1}{2} \times 112 \times BD = 56\,BD$
$$s = \frac{50 + 112 + 78}{2} = 120cm$$
$s - AB = 70\,cm, s - BC = 42\,cm, s - AC = 8\,cm$
Area = $\sqrt{s(s - AB) + (s - BC) + (s - AC)} = 1680\,cm^2$
Now, $56\,BD = 1680\,cm^2$
$BD = 30\,cm$

3. (a) 10°
Explanation:


If the quadrilateral ABCD is concyclic, then,
$\angle A + \angle C = 180^o$
$80^o + 81^o + x = 180^o$
$x = 10^o$

4. (b) 7.2 cm
Explanation: $BC = 4 \times 1.8 = 7.2\,cm$

5. (d) $x = 13, y = -7$

Explanation:
$x + y\sqrt{3} = \frac{5-\sqrt{3}}{2+\sqrt{3}}$
$= \frac{5-\sqrt{3}}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}}$
$= \frac{(5-\sqrt{3})(2-\sqrt{3})}{(2)^2-(\sqrt{3})^2}$
$= \frac{5(2-\sqrt{3})-\sqrt{3}(2-\sqrt{3})}{4-3}$
$= \frac{10-5\sqrt{3}-2\sqrt{3}+3}{1}$
$= 13 - 7\sqrt{3}$
Hence, $x+y\sqrt{3} = 13-7\sqrt{3}$
$\Rightarrow x = 13, y = -7$

6. (d) $x = 55°, y = 40°$

Explanation:

$\angle OQP = 180° - \angle OQF$

$= 180° - (30° + 65°)$

$\Rightarrow \angle OQP = 85°$ ...(i)

$\angle APQ = \angle CQF$ (Corresponding angles)

$\Rightarrow 25° + y° = 65°$

$\Rightarrow y° = 65° - 25°$

$\Rightarrow y° = 40°$

Now in $\triangle OPQ$

$\angle 0 + \angle OPQ + \angle PQO = 180°$

$\Rightarrow x° + 40° + 85° = 180°$

$x° = 180° - 85° - 40° = 55°$

$\Rightarrow x = 55°, y = 40°$

7. (a) $x + y = 7$

Explanation: $x = 2$ and $y = 5$ satisfy the given equation.

8. (a) 21

Explanation:

$x^4 + 2x^3 - 3x^2 + x - 1$

Using remainder theorem,

$= (2)^4 + 2(2)^3 - 3(2)^2 + 2 - 1$

$= 16 + 16 - 12 + 2 - 1$

$= 34 - 13$

$= 21$

9. (b) both rational and irrational number

Explanation: The difference between two distinct irrational numbers can be either a rational number or an irrational number.

e.g difference between π and $(\pi - 3)$ is equal to 3 which is rational

$\sqrt{2}$ and $\sqrt{2} + 1$ both are irrational but their difference is 1 which is rational

Similarly, $\sqrt{2}$ and $\sqrt{3}$ are irrational and their difference ($\sqrt{3} - \sqrt{2}$) is also irrational.

10. (c) 190°

Explanation: $\angle ADC + \angle DCB = 180°$ (Sum of adjacent angles of a parallelogram is 180°)

$\Rightarrow 85° + x = 180° \Rightarrow x = 95°$

Now, DC || AE and CB is a transversal.

$y = x = 95°$ (Alternate interior angles)
$x + y = 95° + 95° = 190°$

11. (a) none of these
Explanation: none of these
Since $0.12\bar{3} = \frac{111}{900} = \frac{37}{300}$

12. (c) (4, -6)
Explanation: because value of y -co-ordinate is – 6

13. (b) 34°
Explanation: Given, POQ is a straight line
$\angle POR + \angle QOR = 180^o$ (Linear pair)
$3x + 2x + 10^o = 180^o$
$5x = 170^o$
$x = 34^o$

14. c) $\sqrt{5}$
Explanation: $\sqrt{5} = 2.23$
Which is a non-terminating and non- repeating decimal therefore it is an irrational and also lies between 2 and 2.5

15. (a) $50°$
Explanation:
In triangle ABC,
$\angle A + \angle B + \angle C = 180^0$
$40^0 + 90^0 + \angle C = 180^0$
$\angle C = 50^0$

16. (b) (4, 0)
Explanation: Since the abscissa or x-coordinate of a point is 4 and this point lies on the x-axis. And the ordinate or y-coordinate of a point lying on the x-axis is 0.
Therefore the coordinate of the point is (4, 0).

17. (a) 1st quadrant
Explanation: The positive solutions of the equation ax + by + c = 0 always lie in the 1st quadrant. Because in 1st quadrant both x and y have positive value.

18. (a) 108
Explanation:
Given: $x + y + z = 9$ and $xy + yz + zx = 23$
$x^3 + y^3 + z^3 - 3xyz = (x + y + z)\left(x^2 + y^2 + z^2 - xy - yz - zx\right)$

$= (x + y + z)\left[(x + y + z)^2 - 2xy - 2yz - 2zx - xy - yz - zx\right]$

$= (x + y + z)\left[(x + y + z)^2 - 3xy - 3yz - 3zx\right]$

$= (x + y + z)\left[(x + y + z)^2 - 3(xy + yz + zx)\right]$

$= (9)\left[(9)^2 - 3(23)\right]$

$= 9 \times [81 - 69]$

= 9 x 12

= 108

19. (a) Both A and R are true and R is the correct explanation of A.

20. (c) A is true but R is false.

    Explanation: There are infinitely many rational numbers between any two given rational numbers.