

Co-ordinate Geometry - Solved Examples

Q 1 - In which quadrant does the given point $(-2, 3)$ lies?

A - II

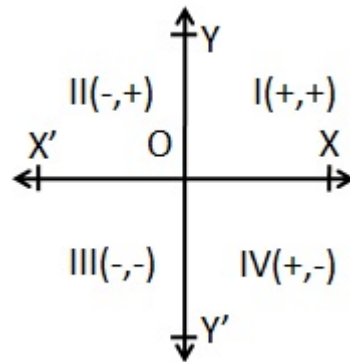
B - III

C - IV

D - I

Answer - A

Explanation



$(-2, 3)$ lies in quadrant II.

Q 2 - Find the distance between the points A (-4, 7) and B (2, 5).

A - 5

B - 6

C - $6\sqrt{5}$

D - 7

Answer - C

Explanation

$$AB = \sqrt{(2+4)^2 + (-5-7)^2} = \sqrt{6^2 + (-12)^2} = \sqrt{36+144} = \sqrt{180} \\ = \sqrt{36 \times 5} = 6\sqrt{5} \text{ units.}$$

Q 3 - Find the distance of the point A (6,-6) from the origin.

A - 5

B - 6

C - $6\sqrt{5}$

D - $6\sqrt{2}$

Answer - D

Explanation

$$OA = \sqrt{6^2 + (-6)^2} = \sqrt{36+36} = \sqrt{72} = \sqrt{36 \times 2} = 6\sqrt{2} \text{ units.}$$

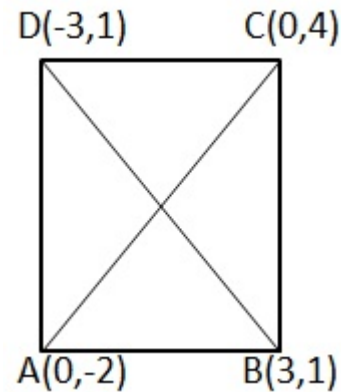
Q 4 - Show that the points A(0,-2) ,B(3,1) ,C(0,4) and D(-3,1) are the vertices of a square.

A - false

B - true

Answer - B

Explanation



$$AB^2 = (3-0)^2 + (1+2)^2 = (9+9) = 18$$

$$BC^2 = (0-3)^2 + (4-1)^2 = (9+9) = 18$$

$$CD^2 = (0-3)^2 + (1+2)^2 = (9+9) = 18$$

$$DA^2 = (-3-0)^2 + (1+2)^2 = (9+9) = 18$$

$$\therefore AB = BC = CD = DA = \sqrt{18} = \sqrt{9 \times 2} = 3\sqrt{2}$$

$$AC^2 = (0-0)^2 + (4+2)^2 = (0+36) = 36$$

$$BD^2 = (-3-3)^2 + (1-1)^2 = (36+0) = 36$$

$$\therefore \text{Diag AC} = \text{Diag BD} = 6$$

Thus all sides are equal and the diagonals are equal.

\therefore ABCD is a square.

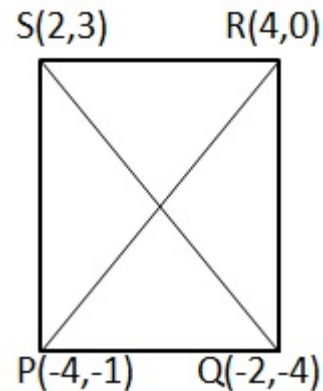
Q 5 - Show that the points P(-4,-1), Q(-2,-4), R(4,0) and S(2,3) are the vertices of a rectangle.

A - false

B - true

Answer - B

Explanation



$$PQ^2 = (-2+4)^2 + (-4+1)^2 = 2^2 + (-3)^2 = (4+9) = 13$$

$$QR^2 = (4+2)^2 + (0+4)^2 = (6^2+4^2) = (36+16) = 52$$

$$RS^2 = (2-4)^2 + (3-0)^2 = (-2)^2 + 3^2 = (4+9) = 13$$

$$SP^2 = (2+4)^2 + (3+1)^2 = (6^2+4^2) = (36+16) = 52$$

$$\therefore PQ=RS = \sqrt{13} \text{ AND } QR=SP = \sqrt{52}$$

$$PR^2 = (4+4)^2 + (0+1)^2 = (8^2+1^2) = (64+1) = 65$$

$$QS^2 = (2+2)^2 + (3+4)^2 = (4^2+7^2) = (16+49) = 65$$

$$\therefore \text{Diag } PR = \text{Diag } QS = \sqrt{65}$$

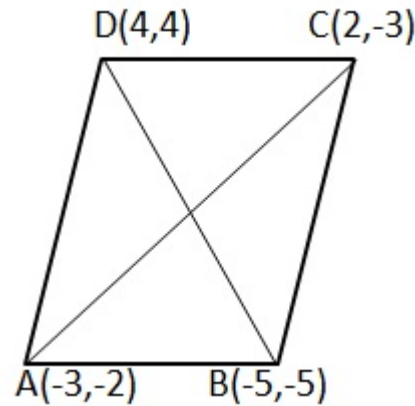
Thus, opposite sides are equal and diagonals are equal.

\therefore ABCD is a rectangle.

Q 6 - Show that the points A (-3, 2), B (-5,-5), C (2,-3) and D (4, 4) are the vertices of a rhombus.

A - false

B - true

Answer - B**Explanation**

$$AB^2 = (-5+3)^2 + (-5-2)^2 = (-2)^2 + (-7)^2 = (4+49) = 53$$

$$BC^2 = (2+5)^2 + (-3+5)^2 = (7)^2 + (2)^2 = (49+4) = 53$$

$$CD^2 = (4-2)^2 + (4+3)^2 = (2^2+7^2) = (4+49) = 53$$

$$DA^2 = (4+3)^2 + (4-2)^2 = (7^2+2^2) = (49+4) = 53$$

$$\therefore AB=BC=CD=DA = \sqrt{53}$$

$$AC^2 = (2+3)^2 + (-3-2)^2 = (5^2) + (-5)^2 = (25+25) = 50$$

$$BD^2 = (4+5)^2 + (4+5)^2 = (9^2) + (9^2) = (81+81) = 162$$

$$\therefore \text{Diag AC} \neq \text{Diag BD}$$

Thus all the sides are equal and diagonals are not equal.

\therefore ABCD is a Rhombus.

Q 7 - Discover the region of ABC whose vertices are A (10, - 6), B (2, 5) and C (- 1, 3).

A - 49/2 sq.units.

B - 47/2 sq.units.

C - 45/2 sq.units.

D - 43/2 sq.units.

Answer - A

Explanation

Here $x_1=10$, $x_2=2$, $x_3 = -1$ and $y_1= -6$, $y_2= 5$, $y_3= 3$
 $\therefore \Delta = \frac{1}{2} \{x_1(y_2-y_3) + x_2(y_3-y_1) + x_3(y_1-y_2)\}$
 $= \frac{1}{2} \{10(5-3) + 2(3+6) - 1(-6-5)\} = \frac{1}{2} (20+18+11) = 49/2 \text{ sq.units.}$

Q 8 - Discover the estimation of h for which the focuses A (- 1, 3), B (2, h) and C (5, - 1) are collinear.

A - 1

B - 2

C - 3

D - 4

Answer - A

Explanation

Here $x_1=-1$, $x_2=2$, $x_3=5$ and $y_1=3$, $y_2=h$ and $y_3=-1$
 Now, $\Delta=0 \Rightarrow x_1(y_2-y_3) + x_2(y_3-y_1) + x_3(y_1-y_2) = 0$
 $\Rightarrow -1(h+1) + 2(-1-3) + 5(3-h) = 0$
 $\Rightarrow -h-1-8+15-5h=0 \Rightarrow 6h=6 \Rightarrow h=1$

Q 9 - Discover the co-ordinates of the centroid of $\triangle ABC$ whose vertices are A (6, - 2) and B (4, - 3) what's more, C (- 1, - 4).

A - (-3,-3)

B - (3,3)

C - (3,-3)

D - (-3,3)

Answer - C

Explanation

The directions of the centroid are
 $\{(6+4-1)/3, (-2-3-4)/3\}$ i.e. (3, - 3)

Q 10 - Discover the proportion in which the point p (2, - 5) partitions the line portion AB joining A (- 3, 5) what's more, B (4, - 9).

A - 1:2

B - 5:2

C - 2:5

D - 2:1

Answer - B

Explanation

Let the required proportion be $x:1$.
At that point $(4x-3/x+1, -9x+5/x+1)$ concurs with p (2, - 5)
 $\therefore 4x-3/(x+1) = 2 \Rightarrow 4x-3 = 2x+2 \Rightarrow 2x=5 \Rightarrow x=5/2$
 \therefore required proportion is $5/2:1$ i.e. 5:2

Q 11 - . Discover the slop of the line whose slant is 30° ?

A - $1/\sqrt{3}$

B - $2/\sqrt{3}$

C - $3/\sqrt{3}$

D - $4/\sqrt{3}$

Answer - A

Explanation

$$m = \tan 30^\circ = 1/\sqrt{3}$$

Q 12 - Discover the slant of line whose slop is $1/\sqrt{3}$

A - 30°

B - 60°

C - 80°

D - Cannot be computed with the given information

Answer - A

Explanation

$$\tan x = 1/\sqrt{3} \Rightarrow x = 30^\circ$$

Q 13 - Discover the slop of the line which goes through focuses A (- 2, 3) and B (4, - 6).

A - $3/2$

B - $-3/2$

C - $3/4$

D - $3/5$

Answer - B

Explanation

$$\text{Slop of AB} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6 - 3/4 + 2}{-9/6} = \frac{-9/4}{-3/2} = \frac{3}{2}$$

Q 14 - Discover the slop of the line whose mathematical statement is $3x+4y-5 = 0$.

A - $3/4$

B - $-3/4$

C - $1/4$

D - $-1/4$

Answer - B

Explanation

$$\begin{aligned} 3x+4y-5 &= 0 \therefore 4y = -3x+5 \therefore y = -3/4x + 5/4 \\ \therefore \text{slop} = m &= -3/4 \end{aligned}$$

Q 15 - Discover the estimation of h for which the line $2x+3y-4 = 0$ and $hx+6y+5 = 0$ are parallel.

A - 2

B - 3

C - 4

D - 5

Answer - C

Explanation

$$2x+3y - 4 =0 \Rightarrow 3y = - 2x+4 \Rightarrow y = - 2x/3 +4/3$$

$$hx+6y+5 =0 \Rightarrow 6y = -hx-5 \Rightarrow y = - hx/6 - 5/6$$

The line will be parallel if $- h/6 -2/3 \Rightarrow h = (2/3*6) = 4$

$$\therefore h=4$$

Q 16 - Discover the estimation of h for which the lines $5x+3y +2=0$ and $3x-hy+6= 0$ are perpendicular to each other.

A - 2

B - 3

C - 4

D - 5

Answer - D

Explanation

$$5x+3y+2 =0 = -5x-2 \Rightarrow y = -5x/3-2/3$$

$$3x- hy+6 =0 \Rightarrow hy = 3x+6 \Rightarrow y = 3x/h+6/h$$

The line will be perpendicular to each other if $-5/3 * 3/h = -1 \Rightarrow h=5$.

Hence $h= 5$.