
1. (1 pt) Question 15:

Are the lines below perpendicular, parallel, or neither?

$$y = 5x + 7 \quad y = -7 + \frac{1}{5}x$$

- A. Perpendicular
- B. Parallel
- C. Neither

SOLUTION

Neither. The first line has slope 5 while the second has slope $\frac{1}{5}$. Two lines are parallel only if they have the same slope, while two lines are perpendicular only if their slopes are related by $m_2 = -\frac{1}{m_1}$ (not just the reciprocal, but -1 times the reciprocal).

2. (1 pt) Find the center and radius of the circle whose equation is $x^2 + 5x + y^2 + 6y + 4 = 0$.

The center of the circle is (____, ____).

The radius of the circle is ____.

Note: Your answers must be decimals.

3. (1 pt) Consider the two points $(1, -10)$ and $(-8, 8)$. The distance between them is: _____

The x co-ordinate of the midpoint of the line segment that joins them is: _____

The y co-ordinate of the midpoint of the line segment that joins them is: _____

4. (1 pt) Find the point (x, y) on the line $y = x$ that is equidistant from the points $(8, -10)$ and $(-4, 3)$.

 $x =$ _____ $y =$ _____

5. (1 pt) The midpoint of AB is at $(1, -3)$. If $A = (3, 5)$, find B .

B is: (____, ____)

6. (1 pt) Find the perimeter of the triangle with the vertices at $(4, 2)$, $(-2, 6)$, and $(-7, -3)$.

Solution:Recall that for two points $P(x_1, y_1)$ and $Q(x_2, y_2)$, the distance between P and Q is

$$|PQ| = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

and that the perimeter of a triangle PQR is the sum of the lengths of its sides: $|PQ| + |QR| + |PR|$.

Therefore the perimeter of the given triangle is

$$\begin{aligned} & \sqrt{(-2 - 4)^2 + (6 - 2)^2} + \sqrt{(-7 + 2)^2 + (-3 - 6)^2} + \sqrt{(-7 - 4)^2 + (-3 - 2)^2} \\ &= \sqrt{52} + \sqrt{106} + \sqrt{146} = 29.5897786655096. \end{aligned}$$

7. (1 pt) Find the center and radius of the circle given by the equation $x^2 + y^2 + 6x + 10y + 18 = 0$

The center is : (____, ____)

The radius is : ____

8. (1 pt) Question 24:Find an equation for the line passing through the point $(6, 5)$ and perpendicular to the line $y = 2x - 14$. $y =$ _____**SOLUTION**Since the line is perpendicular to the line $y = 2x - 14$ (which has slope 2), we know $m = -\frac{1}{2}$ Solving for b we have $f(6) = b + (-\frac{1}{2})(6)$ and therefore

$$b = f(6) - \left(-\frac{6}{2}\right) = 5 + \frac{6}{2} = \frac{16}{2}$$

So $f(x) = -\frac{x}{2} + \frac{16}{2}$

9. (1 pt) Find the standard form for the equation of a circle

$$(x - h)^2 + (y - k)^2 = r^2$$

with a diameter that has endpoints $(-8, -7)$ and $(6, 10)$. $h =$ _____ $k =$ _____ $r =$ _____

10. (1 pt) Find the point (x, y) on the line $y = -2x - 2$ that is equidistant from the points $(0, -3)$ and $(8, -8)$.

 $x =$ _____ $y =$ _____

