

Practice Unit 1 Questions

1. Identify the equation for the circle with center $(2, -2)$ and radius 4.

a. $(x-2)^2 + (y+2)^2 - 4 = 0$

b. $(x+2)^2 + (y-2)^2 - 16 = 0$

c. $(x-2)^2 + (y+2)^2 + 16 = 0$

d. $(x-2)^2 + (y+2)^2 - 16 = 0$

2. Determine the center and radius of the circle given by the equation

$$2x^2 + 2y^2 + 12y - 18 = 0$$

3. Find the equation of the line (in slope-intercept form) which is parallel to $y = 3x + \sqrt{2}$ and goes through $(2, -1)$

4. Given $y_1 = 2x + 4$ and $y_2 = -\frac{1}{2}x + 1$, solve $y_1 > y_2$ and graph the solution as your answer.

5. Write the following in interval/set notation if they are not. Write them in inequality notation if they are not.

a. $kx < 10$

b. $-1 \leq x < \infty$

c. $2 \leq x \leq 4$

d. $\infty < x < \infty$

e. $[2, 3]$

f. $[2, 8)$

g. $(-2, 4)$

6. Given the points $(1, 1)$, $(3, 3)$, $(5, 1)$ find the perimeter of the shape formed by these vertices. Is the triangle an equilateral?

5. a. $(1, 10)$
 b. $[-1, \infty)$
 c. $[2, 4]$
 d. (∞, ∞)
 e. $2 \leq x \leq 3$
 f. $2 \leq x < 8$
 g. $-2 < x < 4$

6. $d_1: (1, 1) \text{ to } (3, 3)$

$$d_1 = \sqrt{(3-1)^2 + (3-1)^2}$$

$$d_1 = \sqrt{2^2 + 2^2}$$

$$d_1 = \sqrt{8}$$

$$d_1 = 2\sqrt{2}$$

$d_2: (3, 3) \text{ to } (5, 1)$

$$d_2 = \sqrt{(5-3)^2 + (1-3)^2}$$

$$d_2 = \sqrt{2^2 + (-2)^2}$$

$$d_2 = \sqrt{4 + 4}$$

$$d_2 = \sqrt{8}$$

$$d_2 = 2\sqrt{2}$$

$d_3: (1, 1) \text{ to } (5, 1)$

$$d_3 = \sqrt{(5-1)^2 + (1-1)^2}$$

$$d_3 = \sqrt{(4)^2 + (0)^2}$$

$$d_3 = \sqrt{16}$$

$$d_3 = 4$$

Perimeter: $4\sqrt{2} + 4$

Not an equilateral triangle.

Practice Unit 1

Answers

1. Standard form of an equation of a circle

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

$$(x-h)^2 + (y-k)^2 - r^2 = 0$$

$$\text{center: } (2, -2) \quad r = 4$$

$$(x-2)^2 + (y+2)^2 - 16 = 0$$

answer d.

2. $2x^2 + 2y^2 + 12y - 18 = 0$

$$x^2 + y^2 + 6y - 9 = 0$$

$$x^2 + y^2 + 6y = 9$$

$$x^2 + (y^2 + 6y) = 9 \quad \left(\frac{6}{2}\right)^2 = 3^2 = 9$$

$$x^2 + (y^2 + 6y + 9) = 9 + 9$$

$$x^2 + (y+3)^2 = 18$$

$$\text{center: } (0, -3)$$

$$\text{radius: } \sqrt{18}$$

3. Parallel to $y = 3x + \sqrt{2}$

$$\text{slope} = 3$$

$$\text{Parallel slope: } 3$$

New line: $y = 3x + b$ Point $(2, -1)$

$$-1 = 6 + b$$

$$-7 = b$$

$$\boxed{y = 3x - 7}$$

4. $2x + 4 > -\frac{1}{2}x + 1$

$$2x + 3 > -\frac{1}{2}x$$

$$3 > -\frac{5}{4}x$$

$$-\frac{12}{5} < x$$

