

GEOMETRY PRACTICE TEST

NAME: Key

Distance Formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

General Form: $ax^2 + by^2 + cx + dy + e = 0$

Equation of Circle: $(x - h)^2 + (y - k)^2 = r^2$

Midpoint Formula: $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

Slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Area: $A = \pi r^2$

Slope-Intercept Form of a Line: $y = mx + b$

Circumference: $C = 2\pi r$

1. Is the point $(10, 14)$ inside, outside, or on the circle $(x - 6)^2 + (y - 15)^2 = 16$?

$(10 - 6)^2 + (14 - 15)^2 = 16$

$4^2 + (-1)^2 = 16$

$16 + 1 \neq 16$

$17 > 16$

LS > RS Outside

LS < RS Inside

LS = RS ON

2. Convert $(x + 4)^2 + (y - 2)^2 = 10$ from standard form to general form.

$(x + 4)(x + 4) + (y - 2)(y - 2) = 10$

$x^2 + 8x + 16 + y^2 - 4y + 4 - 10 = 0$

$x^2 + y^2 + 8x - 4y + 10 = 0$

3. Convert $x^2 + y^2 - 26x - 2y + 166 = 0$ from general form to standard form.

$x^2 - 26x + \underline{169} + y^2 - 2y + \underline{1} = -166 + \underline{169} + \underline{1}$

$\left(\frac{-26}{2}\right)^2 = 169$

$\left(\frac{-2}{2}\right)^2 = 1$

$(x - 13)^2 + (y - 1)^2 = 4$

$(x - 13)(x - 13)$

4. Given two points on a line: $(-2, 8)$ and $(-6, -2)$.

$m = \frac{-2 - 8}{-6 - (-2)} = \frac{-10}{-4} = \frac{5}{2}$

a. Find the slopes of a line parallel to this line.

$// m = \frac{5}{2}$

b. Find the slopes of a line perpendicular to this line.

$\perp m = -\frac{2}{5}$

5. Find the equation of a line that is parallel to $y = -2x + 8$ and goes through the point $(5, -12)$.

$y = mx + b$
 $m = -2$ // $m = -2$ →

$y = \underline{m}x + \underline{b}$

$-12 = (-2)(5) + b$

$-12 = -10 + b$

$b = -2$ →

$y = \underline{m}x + \underline{b}$

$y = -2x - 2$

6. Find the equation of a line that is perpendicular to $y = -3x - 8$ and goes through the point $(12, 1)$.

$m = -3$

$\perp m = \frac{1}{3}$

$y = \underline{m}x + \underline{b}$

$1 = (\frac{1}{3})(12) + b$

$1 = 4 + b$

$-3 = b$

$y = \underline{m}x + \underline{b}$

$y = \frac{1}{3}x - 3$

7. Write the equation of a circle that has a center at $(-5, 12)$ and has a circumference of 8π .

$C = 2\pi r$

$\frac{8\pi}{2\pi} = \frac{2\pi r}{2\pi}$

$4 = r$

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

$(x - (-5))^2 + (y - 12)^2 = 4^2$

$(x + 5)^2 + (y - 12)^2 = 16$

8. Write the equation of a circle that has a diameter with endpoints of $(12, -1)$ and $(-2, -5)$.

Use midpoint to find center

$m = (\frac{12 + (-2)}{2}, \frac{-1 + (-5)}{2})$

$m = (\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$
 $m = (\frac{5}{1}, \frac{-3}{2})$

Use distance formula to find r

$d = \sqrt{(12 - (-2))^2 + (-1 - (-5))^2}$

$d = \sqrt{49 + 16}$

$d = \sqrt{65} = r$

Equation of circle

$(x - 5)^2 + (y - (-3))^2 = (\sqrt{65})^2$

$(x - 5)^2 + (y + 3)^2 = 65$

9. Given the equation $x = 11$ & passes through the point $(3, -7)$

$m = \text{undefined}$

a. Write the equation of a parallel line.

// $m = \text{undefined}$ $(3, -7)$

$x = 3$

b. Write the equation of a perpendicular line.

$\perp m = 0$ $(3, -7)$

$y = -7$

$x = \#$: Vertical
 slope = undefined
 $y = \#$: Horizontal
 slope = zero