

+30

Name KEY
Date _____

Answer each of the following questions.

1. Find the midpoint of the \overline{NM} with M(2, -8) and N(6, -4).

$$\left(\frac{2+6}{2}, \frac{-8+(-4)}{2} \right) \quad \boxed{(4, -6)}$$

+1

2. Find the slope of a line that passes through (-7, 1) and (3, -9).

$$\frac{1+9}{-7-3} = \frac{10}{-10} = \boxed{-1}$$

+1

3. Find the length of \overline{UK} with U(5, -4) and K(0, 9).

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

$$\sqrt{(5-0)^2 + (-4-9)^2}$$

$$\sqrt{25 + 169} = \boxed{\sqrt{194} \text{ units}}$$

label length

+1

4. Find the x-intercept and y-intercept of the line with the equation $5x - 3y = 15$.

$y=0$

$x=0$

$$5x = 15$$

$$\boxed{x=3}$$

$$-3y = 15$$

$$\boxed{y=-5}$$

+2

5. Find the slope and y-intercept of the line whose equation is $-6x + 3y = 15$

$$\boxed{\begin{array}{l} \text{slope} = 2 \\ \text{y-int} = 5 \end{array}}$$

$$3y = 6x + 15$$

$$y = 2x + 5$$

+2

6. Decide if the given pair of equations is parallel or perpendicular.

$y - 3x = -5$ and $y = \frac{-1}{3}x + 4$. Explain your decision.

$y = 3x - 5$
 $m = 3$

$m = -1/3$

⊥ Lines because
 opposite reciprocals

+2

7. Write an equation of the line that passes through (-1, 2) and (5, 3). Express your answer in **standard form**.

$m = \frac{2-3}{-1-5} = \frac{-1}{-6} = \frac{1}{6}$

$y = \frac{1}{6}x + \frac{13}{6}$

$y - 2 = \frac{1}{6}(x + 1)$

$6(y - 2) = \frac{1}{6}(x + 1)$ (cancel 6)

$6y - 12 = x + 1$
 $-1 \quad -1$

$6y - 13 = x$
 $-6y \quad -6y$

$-13 = x - 6y$

+1

8. Write an equation of the line that passes through (4, -8) and is parallel to $y = 5x + 6$. Express your answer in **slope intercept form**.

$m = 5$

$y + 8 = 5(x - 4)$

$y + 8 = 5x - 20$
 $-8 \quad -8$

$y = 5x - 28$

+1

9. Write an equation of the horizontal line that passes through (7, -8).

$y = -8$

$y = -8$

+1

10. Find the value of the discriminant of $3x^2 - 6x + 10 = 0$. State the nature of the roots.

$b^2 - 4ac$

$36 - 4(3)(10)$

$36 - 120 = -84$

2 imaginary
roots

+2

7

Simplify each expression.

11.

$$\frac{\sqrt{-12}}{i\sqrt{12}} \xrightarrow{\text{break up sq. root}} \frac{i\sqrt{4}\sqrt{3}}{2i\sqrt{3}} = \frac{i\sqrt{4}\sqrt{3}}{2i\sqrt{3}}$$

12.

$$\frac{2(4+i)}{4-i(4+i)} = \frac{8+2i}{16-i^2} = \frac{8+2i}{17} = \frac{8}{17} + \frac{2}{17}i$$

13.

$$(3-2i) - 2(5+i) = 3-2i - 10 - 2i = -7-4i$$

seperate in form $a+bi$

Distribute (-2)

Solve each quadratic equation by the method indicated.

15.

$$x^2 + x = +6 \quad (Factoring)$$

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

$$(x+3)(x-2)$$

$$x = -3 \quad x = 2$$

16.

$$m^2 + 6m + 2 = 0 \quad (Complete the Square)$$

$$m^2 + 6m + \boxed{9} = -2 + \boxed{9}$$

$$\left(\frac{6}{2}\right)^2 = 3^2 = 9$$

$$\sqrt{(m+3)^2} = \sqrt{7} \quad \leftarrow \text{square root both sides}$$

$$m+3 = \pm\sqrt{7}$$

$$\begin{matrix} -3 & -3 \end{matrix}$$

$$m = -3 \pm \sqrt{7}$$

complete the square

Sketch the graph of the parabola. Identify the vertex, axis of symmetry, x-intercept, and y-intercept.

$$18. \quad y = w^2 - 2w - 8$$

$$\frac{-b}{2a} \text{ AOS is } \frac{2}{2} = 1 \quad \boxed{x=1}$$

$$\text{Vertex } \boxed{(1, -9)}$$

$$y = 1^2 - 2(1) - 8$$

$$y = 1 - 2 - 8$$

$$y = -9$$

$$\text{y-int (when } x=0)$$

$$y = 0^2 - 2 \cdot 0 - 8$$

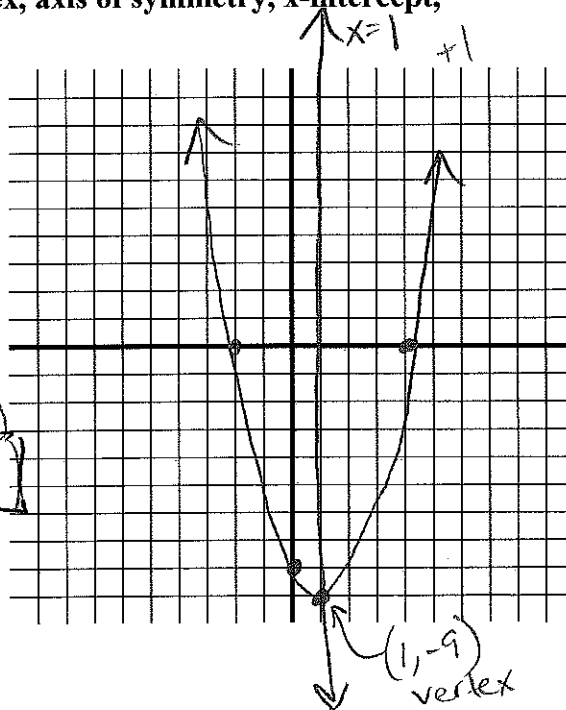
$$\boxed{y = -8}$$

$$\text{x-int (when } y=0)$$

$$0 = w^2 - 2w - 8$$

$$0 = (w-4)(w+2)$$

$$\boxed{w=4} \quad \boxed{w=-2}$$



+5

110