

## Unit 1 - Review

### Solve Systems Algebraically — Substitution or Elimination

Solve each system of equations. Remember to express the answer as a point.

$$\begin{aligned} 1. \quad & 4x + y = 2 \\ & x - y = 3 \end{aligned}$$

$$\begin{array}{r} 4x + y = 2 \\ -4x \phantom{+ y} = -4x \\ \hline y = 2 - 4x \end{array}$$

$$x - (2 - 4x) = 3$$

$$x - 2 + 4x = 3$$

$$\begin{array}{r} 5x - 2 = 3 \\ +2 \quad +2 \\ \hline 5x = 5 \end{array}$$

$$\begin{array}{r} 1 - y = 3 \\ -1 \phantom{- y} = -1 \\ \hline -y = 2 \\ \hline y = -2 \end{array}$$

$$y = -2$$

$$x = 1$$

$$\star (1, -2)$$

$$5x = 5$$

### Solve Systems Graphically

Solve each system of equations by solving for y (if needed) and graphing them in the calculator.

$$\begin{aligned} 6. \quad & y = x^2 \\ & 3x - y = 2 \end{aligned}$$

$$\begin{array}{r} 3x - y = 2 \\ -3x \phantom{- y} = -3x \\ \hline -y = 2 - 3x \\ \hline y = 2 - 3x \end{array}$$

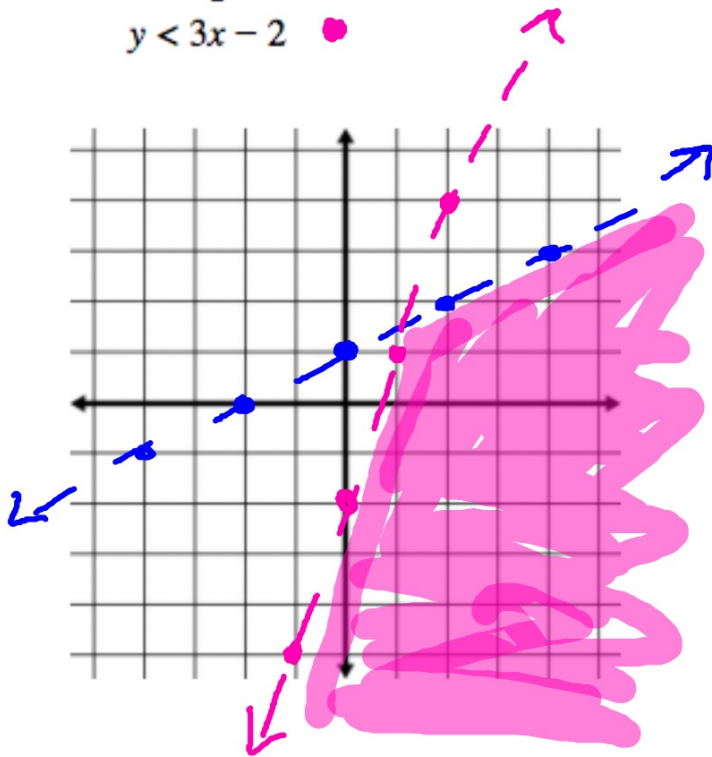
$$y = -2 + 3x$$

$(1, 1) \quad (2, 4)$

### Solve Systems of Inequalities

Solve each system of inequalities. Pay attention to whether the inequalities would have solid or dotted lines as well as where the shading belongs.

7.  $y < \frac{1}{2}x + 1$  ●  
 $y < 3x - 2$  ●



\* If  $\div$  by a negative, flip sign

test point (0,0)

$$0 < \frac{1}{2}(0) + 1$$

$$0 < 1 \text{ true!}$$

$$0 < 3(0) - 2$$

$$0 < -2$$

false!

### Solve Absolute Value Functions

Solve for x.

11.  $3|x+7|+17=5$

$$\begin{array}{r} -17 \quad -17 \\ \hline 3|x+7| = -12 \\ \hline 3 \quad 3 \end{array}$$

$$|x+7| = -4$$

No Solution

### Graph Absolute Value Functions

Graph each absolute value function using a t-table.

Right 1  
Stretch by 2

13.  $y = -2|x-1|$  Reflect over x



### Applications of Systems

15. An exam worth 145 points contains 50 questions. Some of the questions are worth two points and the rest are worth five points. How many of each type of question is on the test?

$x = 2$  point question

$y = 5$  point questions +

$$\begin{cases} 2x + 5y = 145 \\ -2(x + y = 50) \end{cases}$$

$$x + 15 = 50$$

$$\boxed{x = 35}$$

$$\begin{array}{r} \cancel{2x + 5y = 145} \\ \cancel{-2x - 2y = -100} \\ \hline \end{array}$$

$$\frac{3y}{3} = \frac{45}{3}$$

$$\boxed{y = 15}$$

### Inverses of Functions

Determine the inverse. State if the inverse is a function.

20.  $f(x) = (3x - 11)^2$

$$\pm\sqrt{x} = \sqrt{(3y - 11)^2}$$

$$\begin{array}{r} \pm\sqrt{x} = 3y - 11 \\ +11 \qquad \qquad \qquad +11 \\ \hline \frac{11 \pm \sqrt{x}}{3} = \frac{3y}{3} \end{array}$$

- ① Switch  $x$  &  $y$
- ② Solve for  $y$

$$f^{-1}(x) = \frac{11 \pm \sqrt{x}}{3}$$

### Function Operations

Given  $f(x) = x + 2$ ,  $g(x) = 7x - 5$ , and  $h(x) = 2x^2 + 8$ , find the following:

22.  $(g \cdot f)(x)$

*multiply*

$$(7x - 5)(x + 2) = 7x^2 + 14x - 5x - 10$$
$$= 7x^2 + 9x - 10$$

### Compositions of Functions

Given  $f(x) = 3x + 4$ ,  $g(x) = 2x^2 - 1$ , and  $h(x) = x^3$ , find the following:

27.  $(h \circ g)(x)$

*Composition*