

## Unit 6 Review

Name Key

### Intro Precalculus

#1 - 4: Solve each system.

1) Solve by graphing:  $\begin{cases} -\ln(x-3) - y = 5 \\ -\frac{2}{3}x + y = -5 \end{cases}$

$(5.04, -1.64)$

2)  $\begin{cases} -7y + 5x = 11 \\ 3y + 20x = 44 \end{cases}$

$(\frac{11}{5}, 0)$

3)  $\begin{cases} x^2 + y^2 = 5 \\ y = 3x - 5 \end{cases}$

$(1, -2)$

and

$(2, 1)$

4)  $\begin{cases} y = x^2 + 6x + 5 \\ x + y = 5 \end{cases}$

$(0, 5)$

and

$(-7, 12)$

5) At a grocery store, a tub of ice cream is on sale for \$1.12 less than the regular price. The cost of 5 tubs at regular price is the same as the cost of 7 tubs at sale price. Let  $r$  be the regular price of a tub of ice cream and  $s$  be the sale price of a tub of ice cream. Write a system of equations that can be used to find the values of variables  $r$  and  $s$ . Then find  $r$  and  $s$ .

$$\begin{aligned} s &= r - 1.12 \\ 5r &= 7s \end{aligned}$$

$$\begin{aligned} 5r &= 7(r - 1.12) \\ 5r &= 7r - 7.84 \\ -2r &= -7.84 \end{aligned}$$

$r = \$3.92$

$s = \$2.80$

6) Find the value of  $k$  so that the system is dependent.

$$-12 \left( -\frac{4}{3} \right) = 16$$

$k = 16$

$$\times \frac{-4}{3} \begin{cases} 3x - 12y = 21 \\ -4x + ky = -28 \end{cases} \times \frac{-4}{3}$$

→ Infinitely Many Solutions  
↓  
Same line

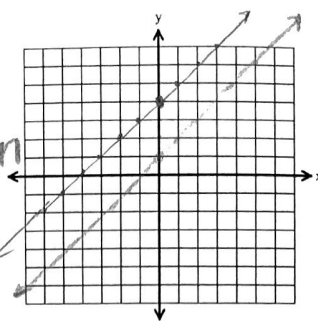
7) Create and graph a 2-variable linear system that is *inconsistent*.

answers  
vary!

$$y = x + 4$$

$$y = x + 1$$

↓  
no solution  
↓  
parallel



8) **Show work** to determine whether the triple  $(3, -1, -2)$  is a solution to the system:

$$\begin{cases} x - 3y + 2z = 2 \\ 5x + y - z = 16 \\ -4x - 2y + 3z = -20 \end{cases}$$

Not a solution

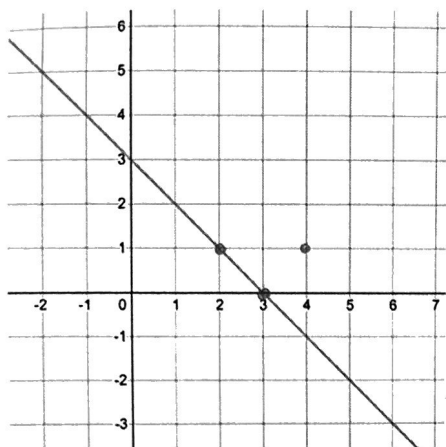
9) Solve the system: 
$$\begin{cases} 2x + y - 2z = -1 \\ 3x - 3y - z = 5 \\ x - 2y + 3z = 6 \end{cases}$$

$(1, -1, 1)$

10) Solve the system: 
$$\begin{cases} x - y + 3z = 8 \\ 3x + y - 2z = -2 \\ 2x + 4y + z = 0 \end{cases}$$

$(1, -1, 2)$

Find the solution of the system given by the line graphed and  $y = x^2 - 6x + 9$ .



$$y = (x - 3)^2$$

$(3, 0)$  and  $(2, 1)$

#12 – 13: Write the partial fraction decomposition of each rational expression.

12)  $\frac{3}{x^2 - 7x + 10} = \frac{A}{(x-5)} + \frac{B}{(x-2)}$

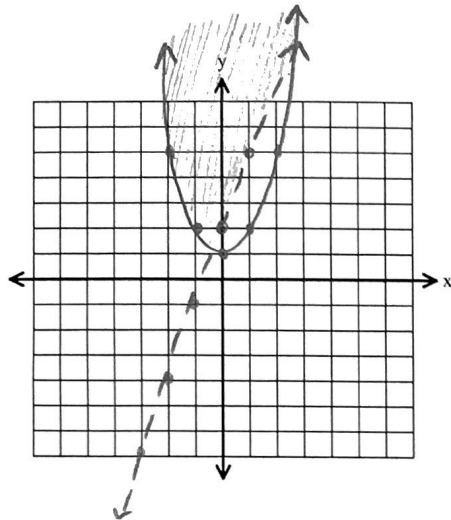
$$\frac{-1}{x-2} + \frac{1}{x-5}$$

13)  $\frac{-2x-17}{x^2-3x-4}$

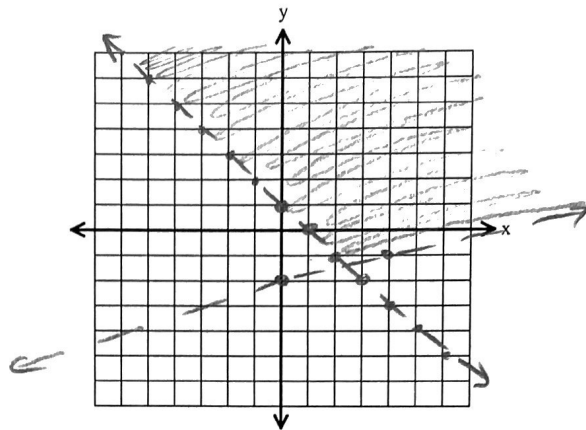
$$\frac{3}{x+1} + \frac{-5}{x-4}$$

#14 – 15: Graph each system of inequalities.

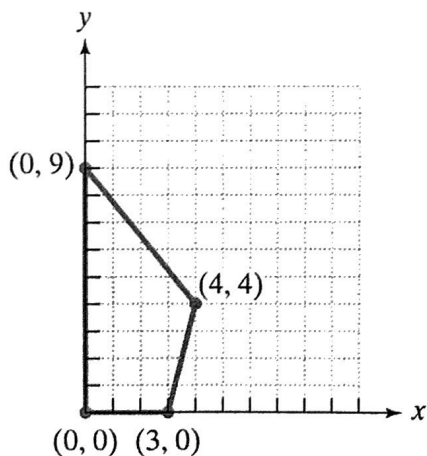
14)  $\begin{cases} y > 3x + 2 \\ y \geq x^2 + 1 \end{cases}$



15)  $\begin{cases} x + y > 1 \rightarrow y > -x + 1 \\ 2x - 4y < 8 \rightarrow y > \frac{1}{4}x - 2 \end{cases}$



16) Use the feasible region graphed below and the objective function  $z = 30x + 45y$  representing profit. Test the values at each corner of the graphed region to find the maximum profit.



max: 405