

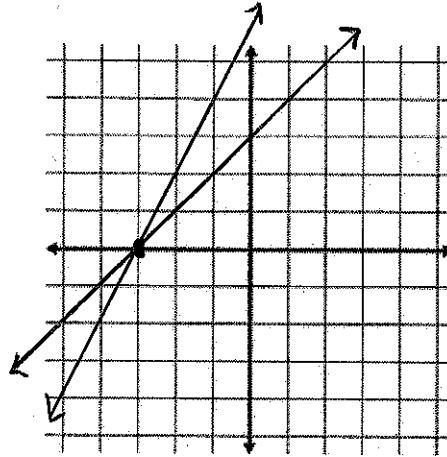
Name: _____

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BLUE Chapter 5 Practice 1

Graph the following systems of equations. (3pts each)

1) $y = x + 3$
 $y = 2x + 6$



Answers

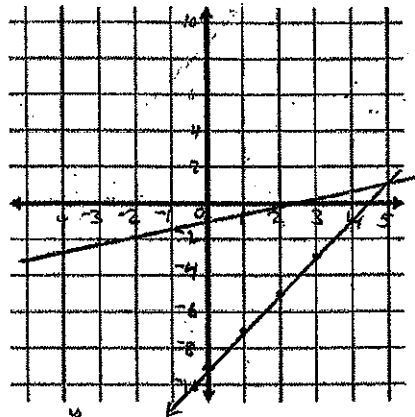
1) $(-3, 0)$

2) $x = 3y + 2$
 $2x = y + 9$
 $y = 2x - 9$

$$\begin{array}{r} -3y = -x + 2 \\ \underline{-2} \quad \underline{-3} \\ y = \frac{1}{3}x - \frac{2}{3} \end{array}$$

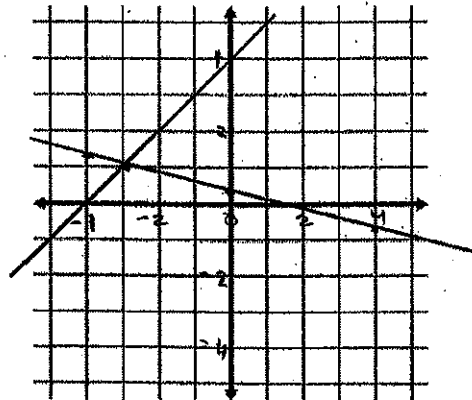
x	$\frac{1}{3}x - \frac{2}{3}$	y
0	$\frac{1}{3}(0) - \frac{2}{3}$	$-\frac{2}{3}$
1	$\frac{1}{3}(1) - \frac{2}{3}$	-
2	$\frac{1}{3}(2) - \frac{2}{3}$	0
3		$\frac{1}{3}$

$x = 5$
 $y = \frac{1}{3}(5) - \frac{2}{3} = 1$



2) $(5, 1)$

3) $y = -\frac{1}{4}x + \frac{1}{4}$
 $y = x + 4$



3) $(-3, 1)$

Solve each system of equations using substitution. Check each answer.

(3pts each)

4) $y = 2x$
 $6x - y = 8$

$$\begin{array}{r} 6x - y = 8 \\ + y \quad + y \\ \hline 6x = 8 + y \\ \boxed{6x - 8 = y} \\ y = 2x \\ 6x - 8 = 2x \\ -2x \quad -2x \\ \hline 4x - 8 = 0 \\ +8 \quad +8 \\ \hline 4x = 8 \\ \boxed{x = 2} \end{array}$$

$$\begin{array}{l} y = 2x \\ y = 2(2) \\ y = 4 \end{array}$$

Check

$$\begin{array}{l} 6x - y = 8 \\ 6(2) - 4 \stackrel{?}{=} 8 \\ 12 - 4 = 8 \checkmark \end{array}$$

4) $(2, 4)$

5) $x - 3y = 14$
 $x - 2 = 0$

$$\begin{array}{l} x - 2 = 0 \\ \boxed{x = 2} \\ x - 3y = 14 \\ (2) - 3y = 14 \\ -2 \quad -2 \\ \hline -3y = 12 \\ \div -3 \quad \div -3 \\ \hline \boxed{y = -4} \end{array}$$

Check

$$\begin{array}{l} x - 3y = 14 \\ 2 - 3(-4) \stackrel{?}{=} 14 \\ 2 - -12 = 14 \checkmark \end{array}$$

5) $(2, -4)$

6) $4x + y = -2$
 $-2x - 3y = 1$

$$\begin{array}{l} 4x + y = -2 \\ -4x \quad -4x \\ \hline \boxed{y = -4x - 2} \\ -2x - 3y = 1 \\ +2x \quad +2x \\ \hline -3y = 2x + 1 \\ \div -3 \quad \div -3 \\ \hline \boxed{y = -\frac{2}{3}x - \frac{1}{3}} \end{array}$$

$$\begin{array}{l} -\frac{2}{3}x - \frac{1}{3} = -4x - 2 \\ +\frac{2}{3}x \quad +\frac{2}{3}x \\ \hline -\frac{1}{3} = -3\frac{1}{3}x - 2 \\ +2 \quad +2 \\ \hline \frac{1}{3} = -3\frac{1}{3}x \\ \div -3\frac{1}{3} \quad \div -3\frac{1}{3} \\ \hline \frac{5}{3} \div -\frac{10}{3} = \frac{5}{3} \times \frac{3}{-10} \\ \hline \boxed{x = -\frac{1}{2}} \end{array}$$

Check

$$\begin{array}{l} y = -\frac{4}{1}\left(-\frac{1}{2}\right) - 2 \\ \boxed{y = 0} \\ \text{CHECK} \\ -2x - 3y = 1 \\ -2\left(-\frac{1}{2}\right) - 3(0) \stackrel{?}{=} 1 \\ \frac{2}{2} - 0 \stackrel{?}{=} 1 \checkmark \end{array}$$

6) $\left(-\frac{1}{2}, 0\right)$

Solve each system of equations using elimination. (3pts each)

$$7) \begin{cases} 3x + 2y = 6 \\ -x - 2y = 4 \end{cases}$$

$$2x = 10$$

$$\boxed{x = 5}$$

$$3x + 2y = 6$$

$$3(5) + 2y = 6$$

$$15 + 2y = 6$$

$$\begin{array}{r} 15 + 2y = 6 \\ -15 = -15 \\ \hline 2y = -9 \end{array}$$

$$2y = -9 \quad \boxed{y = -4.5}$$

CHECK

$$-x - 2y = 4$$

$$-(5) - 2(-4.5) \stackrel{?}{=} 4$$

$$-5 + 9 = 4 \checkmark$$

$$7) \underline{(5, -4.5)}$$

$$8) \begin{cases} 5x + 3y = 15 \\ 5x - 2y = 10 \end{cases}$$

$$0 + 5y = 5$$

$$\boxed{y = 1}$$

$$5x + 3y = 15$$

$$5x + 3(1) = 15$$

$$\begin{array}{r} 5x + 3(1) = 15 \\ -3 = -3 \\ \hline 5x = 12 \end{array}$$

$$\frac{5x = 12}{\div 5} \quad \boxed{x = 2.4}$$

CHECK

$$5(2.4) - 2(1) \stackrel{?}{=} 10$$

$$12 - 2 = 10 \checkmark$$

$$8) \underline{(2.4, 1)}$$

$$9) \begin{cases} 4x + 5y = 20 \\ 2x - y = 10 \end{cases} \rightarrow$$

$$4x + 5y = 20$$

$$-4x - 2y = 20$$

$$0 + 7y = 0$$

$$\boxed{y = 0}$$

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

$$4x - 2y = 20$$

$$2x - y = 10$$

$$2x - 0 = 10$$

$$2x = 10$$

$$\boxed{x = 5}$$

CHECK

$$4x + 5y = 20$$

$$4(5) + 5(0) \stackrel{?}{=} 20$$

$$20 = 20 \checkmark$$

$$9) \underline{(5, 0)}$$

Use a system of linear equations to solve each problem. (4pts each)

10) A local band is planning to make a CD. It will cost \$12,500 to produce and record a master copy and an addition \$2.50 to make each sale copy. If they plan to sell the final product for \$7.50 how many disks must they sell to break even?

10) see left

a) Write an equation for the expenses.

$$12,500 + 2.5x = \text{expenses}$$

b) Write an equation for the sales.

$$7.5x = \text{cost}$$

c) Solve the system of equations to find the number of CDs to be sold in order to break even.

$$\begin{array}{r} 12,500 + 2.5x = 7.5x \\ -2.5x \quad -7.5x \\ \hline 12,500 = 5x \end{array}$$

2,500 CDs need to be sold
in order to break even (no money lost, but no profit)

11) Suppose you are deciding whether to buy ski equipment. Typically it costs you \$60 a day to rent ski equipment and buy a lift ticket. You can buy ski equipment for \$400. A lift ticket alone costs \$35 for one day. Find the break even point.

11) see left

a) Write an equation that shows the cost of renting.

$$60d = \text{renting cost}$$

b) Write an equation that shows the cost of buying the equipment (and lift ticket)

$$400 + 35d = \text{buying costs}$$

c) Solve the system of equations.

$$\begin{array}{r} 60d = 400 + 35d \\ -35d \quad -35d \\ \hline 25d = 400 \end{array}$$

$$\begin{array}{r} 25d = 400 \\ \div 25 \quad \div 25 \\ \hline d = 16 \text{ days} \end{array}$$

$$\begin{array}{r} 16 \\ 25 \overline{)400} \\ \underline{400} \\ 0 \end{array}$$

$$d = 16 \text{ days}$$

12) A garden center sells two types of lawn mowers. Total sales of mowers for the year were \$8379.70. The total number of mowers sold was 30. The small mower costs \$249.99. The large mower costs \$329.99. Find the number of each type sold.

12) see left

$$8379.70 = 249.99S + 329.99L$$

$$30 = S + L$$

$$30 = S + 11$$

elimination
249.99(30 = S + L)
7,499.70 =

$$\begin{array}{r} 8379.70 = 249.99S + 329.99L \\ - 7499.70 = 249.99S + 249.99L \\ \hline 880 = 80L \\ \div 80 \quad \div 80 \\ \hline L = 11 \end{array}$$

19 = small
11 = Large