

4) Factor the following expression: $x^2 - 4x - 32$



5) Factor the following expression: $49x^2 - 81$

6) Factor the following expression completely: $5x^3 - 80x$

7) (a) Solve the inequality below.

$$4(x + 2) < 7x - 16$$



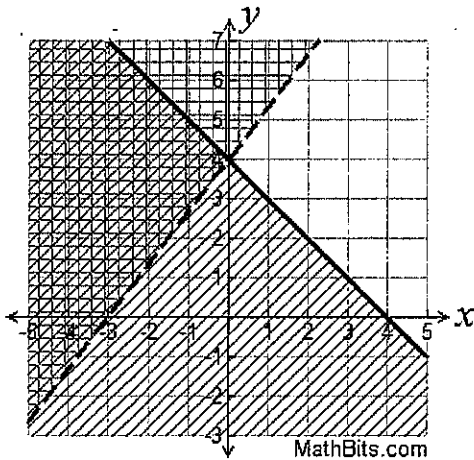
(b) State the smallest possible integer value for x in the solution set.

8) Frankie has eight more nickels than dimes in his wallet for a total of \$1.45. Write an equation that could be used to determine the number of dimes, x , in his wallet.



- 9) When solving the equation $8(2x^2 + 9) - 15 = 14x^2 + 19$, Mikayla wrote $8(2x^2 + 9) = 14x^2 + 34$ as her first step. What property justifies Mikayla's first step?

- 10) State one point that lies in the solution set of the system of inequalities graphed below.



- 11) Solve the equation below for x in terms of g .

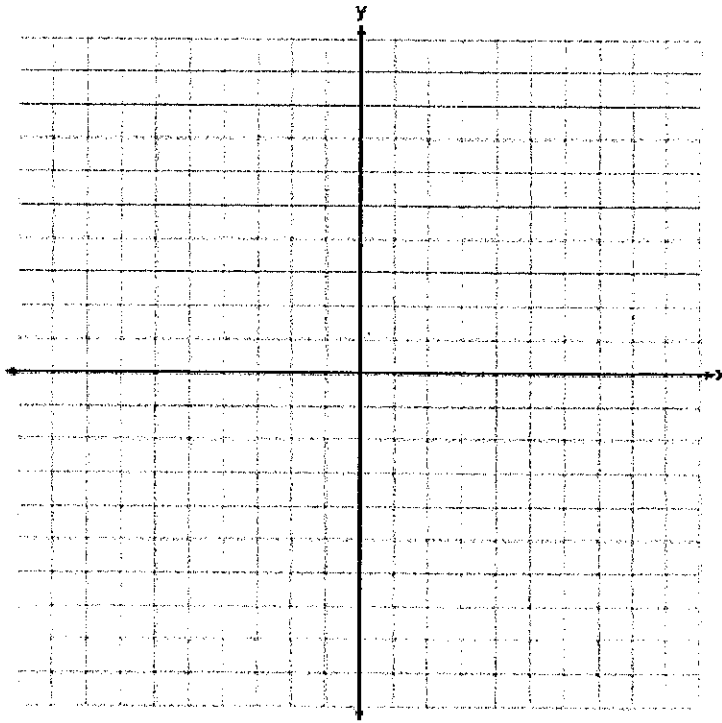
$$7(gx + 9) = 75$$

- 12) Danny joins a new gym. His monthly subscription will charge him \$20 per month and an additional \$0.20 for each minute he works with a personal trainer.

(a) Write a function which describes his monthly cost, c , as a function of minutes with a personal trainer, m .

(b) Using the function you wrote, what would his bill be for a month that he used 420 minutes with a personal trainer?

13) On the set of axes below, graph the equation $y = -\frac{2}{5}x + 2$.



14) The length of a rectangular fence is two more than five times the width. Find the dimensions of the fence if the perimeter is 112 feet.

Do Now - Midterm Review

1) Find the product of the following expression: $(x - 7)^2$

$$\begin{aligned} & (x-7)(x-7) \\ & x^2 - 7x - 7x + 49 \\ & \boxed{x^2 - 14x + 49} \end{aligned}$$

2) Find the product of the following expression: $(x-3)(x^2-4x+9)$

$$\begin{aligned} & x^3 - 4x^2 + 9x - 3x^2 + 12x - 27 \\ & \boxed{x^3 - 7x^2 + 21x - 27} \end{aligned}$$

3) (a) Simplify the expression $(5x^2 - 4x + 7) - (x^2 + 6x - 3)$ and write the answer in standard form.

$$\begin{aligned} & (5x^2 - 4x + 7) - 1(x^2 + 6x - 3) \\ & 5x^2 - 4x + 7 - x^2 - 6x + 3 \\ & \boxed{4x^2 - 10x + 10} \end{aligned}$$

(b) When the difference from part (a) is multiplied by $\frac{1}{4}x^2$, what is the result written in standard form?

$$\begin{aligned} & \frac{1}{4}x^2(4x^2 - 10x + 10) \\ & \boxed{1x^4 - \frac{5}{2}x^3 + \frac{5}{2}x^2} \\ & \quad \downarrow \\ & 1x^4 - 2\frac{1}{2}x^3 + 2\frac{1}{2}x^2 \end{aligned}$$

4) Factor the following expression: $x^2 - 4x - 32$

$$(x-8)(x+4)$$

5) Factor the following expression: $49x^2 - 81$ DUPS

$$(7x+9)(7x-9)$$

6) Factor the following expression completely: $5x^3 - 80x$

$$5x(x^2 - 16) \text{ GCMF}$$
$$5x(x+4)(x-4) \text{ DUPS}$$

7) (a) Solve the inequality below.

$$4(x+2) < 7x - 16$$
$$4x + 8 < 7x - 16$$
$$\begin{array}{r} -4x \quad -4x \\ \hline \end{array}$$

$$\begin{array}{r} 8 < 3x - 16 \\ +16 \quad +16 \\ \hline \end{array}$$

$$\frac{24 < 3x}{3 \quad 3}$$

$$8 < x \quad \text{OR} \quad x > 8$$

(b) State the smallest possible integer value for x in the solution set.

$$9$$

8) Frankie has eight more nickels than dimes in his wallet for a total of \$1.45. Write an equation that could be used to determine the number of dimes, x , in his wallet.

Let x = the # of dimes
 $x+8$ = the # of nickels

$$.10(x) + .05(x+8) = 1.45$$

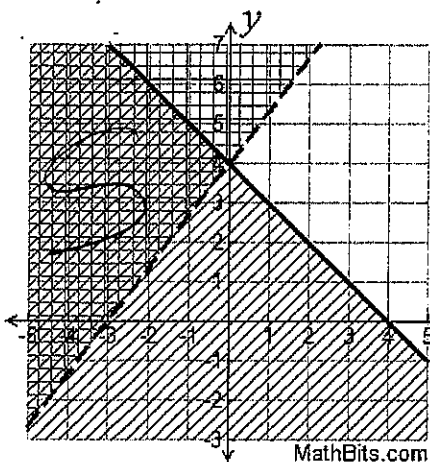
$.10(x)$ = the total value of the dimes
 $.05(x+8)$ = the total value of the nickels

- 9) When solving the equation $8(2x^2 + 9) - 15 = 14x^2 + 19$, Mikayla wrote $8(2x^2 + 9) = 14x^2 + 34$ as her first step. What property justifies Mikayla's first step?

$$\begin{array}{r} 8(2x^2 + 9) - 15 = 14x^2 + 19 \\ \quad \quad \quad +15 \quad \quad \quad +15 \\ \hline 8(2x^2 + 9) = 14x^2 + 34 \end{array}$$

Addition Property of Equality

- 10) State one point that lies in the solution set of the system of inequalities graphed below.



$(-4, 3)$

* Choose a point that it is in the region where the shading intersect (overlap)

- 11) Solve the equation below for x in terms of g .

$$7(gx + 9) = 75$$

$$\begin{array}{r} 7gx + 63 = 75 \\ \quad \quad \quad -63 \quad -63 \\ \hline \end{array}$$

$$\frac{7g \cancel{x} = 12}{7g \quad 7g}$$

$$x = \frac{12}{7g}$$

- 12) Danny joins a new gym. His monthly subscription will charge him $\$20$ per month and an additional $\$0.20$ for each minute he works with a personal trainer.

- (a) Write a function which describes his monthly cost, c , as a function of minutes with a personal trainer, m .

$$\begin{aligned} y &= mx + b \\ m &= .20 \\ b &= 20 \end{aligned}$$

$$C = .20m + 20$$

- (b) Using the function you wrote, what would his bill be for a month that he used 420 minutes with a personal trainer?

$$C = .20m + 20$$

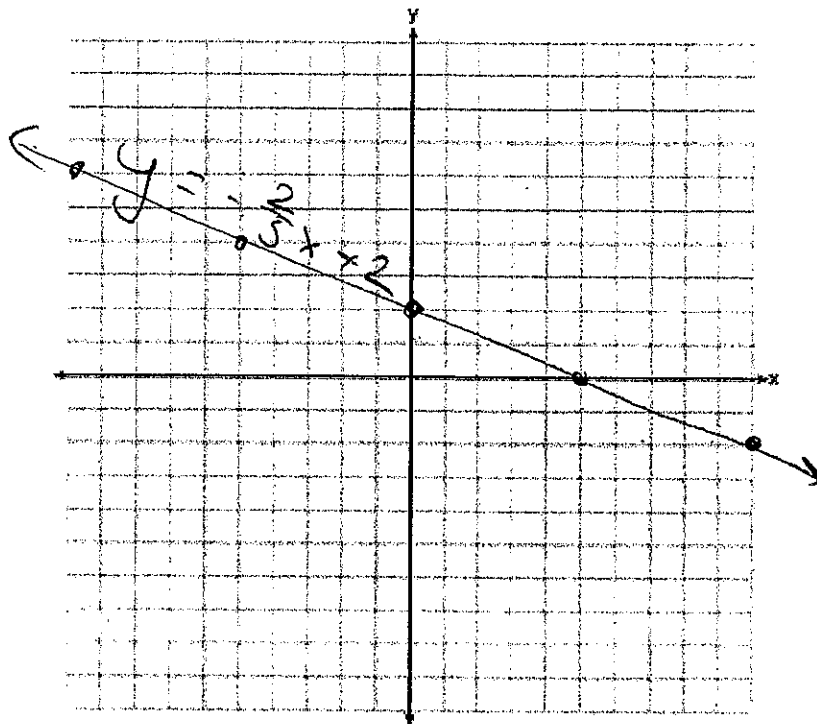
$$C = .20(420) + 20$$

$$C = 84 + 20$$

$$C = 104$$

$$\$104$$

13) On the set of axes below, graph the equation $y = -\frac{2}{5}x + 2$.

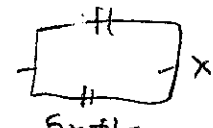


$$y = -\frac{2}{5}x + 2$$

$$m = -\frac{2}{5} \downarrow \rightarrow$$

$$b = 2$$

14) The length of a rectangular fence is two more than five times the width. Find the dimensions of the fence if the perimeter is 112 feet.

L	P	L	C
<p>let $x =$ the width of the rectangle $5x + 2 =$ the length of the rectangle</p> 	$2(x) + 2(5x + 2) = 112$ $2x + 10x + 4 = 112$ $12x + 4 = 112$ $\begin{array}{r} -4 \quad -4 \\ \hline 12x = 108 \\ \frac{12x}{12} = \frac{108}{12} \\ x = 9 \\ 5x + 2 = 47 \end{array}$	<p>the width of the rectangle is 9 ft the length of the rectangle is 47 ft</p>	$5(9) = 45$ $45 + 2 = 47$ <hr/> $2(9) = 18$ $2(47) = 94$ $\frac{18}{+} \frac{94}{=} 112 \checkmark$
<p>let $x =$ the length of the rectangle $y =$ the width of the rectangle</p>	$x = 5y + 2$ $2x + 2y = 112$ $2(5y + 2) + 2y = 112$ $10y + 4 + 2y = 112$ $12y + 4 = 112$ $\begin{array}{r} -4 \quad -4 \\ \hline 12y = 108 \\ \frac{12y}{12} = \frac{108}{12} \\ y = 9 \end{array}$ $x = 5y + 2$ $x = 5(9) + 2$ $x = 47 \text{ ft}$	<p>the width of the rectangle is 9 ft & the length of the rectangle is 47 ft</p>	$5(9) = 45$ $45 + 2 = 47$ <hr/> $2(9) = 18$ $2(47) = 94$ $\frac{18}{+} \frac{94}{=} 112 \checkmark$