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From Chapter 3

1) Multiply.

a)  $(x+4)(x+6)$   $x^2 + 6x + 4x + 24$

=  $x^2 + 10x + 24$

b)  $(2x-3)(x+5)$

$2x^2 + 7x - 15$

c)  $(x+4)(x^2+2x-3)$

$x^3 + 2x^2 - 3x + 4x^2 + 8x - 12$

$x^3 + 6x^2 + 5x - 12$

2) Factor.

a)  $3x-6$   $3(x-2)$

b)  $-5x+10$   $-5(x-2)$

c)  $x^2-100$   $(x+10)(x-10)$

d)  $4x^2-49$   $(2x+7)(2x-7)$

e)  $x^2+8x+12$

$x^2 + 2x + 6x + 12 = x(x+2) + 6(x+2)$

f)  $y^2-3y-18$   $(y+3)(y-6)$

$y^2 + 3y - 6y - 18 = y(y+3) - 6(y+3)$

g)  $6x^2+13x-5$   $(y-6)(y+3)$

h)  $3x^2-27$

$6x^2 - 27x + 15x - 5$

$3x(2x-9) + 5(3x-1)$

$(2x+5)(3x-1)$

$3(x^2-9)$

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

From Chapter 4

1) Simplify the following radicals.

$\sqrt{50}$   $5\sqrt{2}$   $\sqrt{200}$   $10\sqrt{2}$   $\sqrt{64}$   $= 8$

$\sqrt[3]{80}$   $2\sqrt[3]{10}$   $\sqrt[3]{728}$   $4\sqrt[3]{2}$   $\sqrt[3]{80}$   $2\sqrt[3]{5}$

2) Rewrite as an entire radical.

$2\sqrt{5}$   $\sqrt{20}$

$4\sqrt{5}$   $\sqrt{192}$

3) Evaluate (without using a calculator).

$4^{\frac{3}{2}}$   $(\sqrt{4})^3 = 2^3 = 8$   $8^{\frac{1}{4}}$   $(\sqrt[4]{8})^4 = 16$   $(-16)^{\frac{5}{2}}$   $(\sqrt{-16})^3 \rightarrow$  no solution

$(\frac{1}{8})^{\frac{3}{4}}$   $\sqrt[4]{\frac{1}{8}}$   $= \frac{1}{2}$   $(\frac{1}{2})^{\frac{3}{4}}$   $= \frac{1}{2}$   $16^{\frac{3}{4}}$   $(\sqrt[4]{16})^3 = 2^3 = 8$

4) Express each radical as a power.

$(\sqrt{4})^5$   $4^{\frac{5}{2}}$   $\sqrt{5.5}$   $(5.5)^{\frac{1}{2}}$

5) Simplify the following. Write all powers with positive exponents.

$\frac{x^2y^3}{xy^5}$

$xy^2$

$(x^{-2}y^3)(x^4y^{-1})$

$\frac{y^3x^4}{y^4x^2}$

$(\frac{x^2}{x})^3$

$x^{12}$

$\frac{x^6}{x}$

$2-1=1 \rightarrow x$

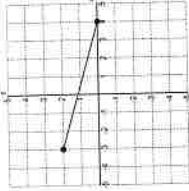
$3-5=-2 \rightarrow y$

$\frac{x}{y^2}$

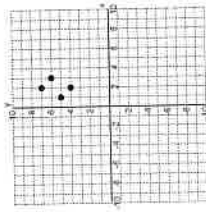
From Chapter 5

1) Write the Domain and Range for each of these relations.

a)  $\{(0,3), (1,4), (2,5)\}$   
 Domain:  $\{0, 1, 2\}$   
 Range:  $\{3, 4, 5\}$

b)   
 Domain:  $-3 \leq x \leq 4$   
 Range:  $0 \leq y \leq 2$

2) Is the relation a function (yes or no)?

  
 no

3) Is the function a linear relation (yes or no)?

a)  $\{(0, 30), (1, 20), (2, 10), (3, 0)\}$   
 yes, rate of change is constant

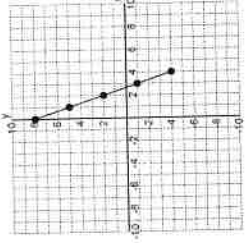
b)  $\{(1, 1), (2, 2), (3, 4), (4, 7), (5, 11)\}$   
 no, rate of change is not constant

x	y
0	30
1	20
2	10
3	0

x	y
1	1
2	2
3	4
4	7
5	11

4) What is the rate of change for each linear relation below?

a)  $\{(2, 10), (4, 20), (6, 30)\}$   $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{20 - 10}{4 - 2} = \frac{10}{2} = 5$   
 rate of change is 5

b)   
 $m = \frac{5 - 2}{1 - 2} = -3$   
 rate of change is -3

5) If the function is  $f(x) = 2x + 4$ , find  $f(3)$ .

$f(3) = 2(3) + 4$

$f(3) = 6 + 4$

$f(3) = 10$

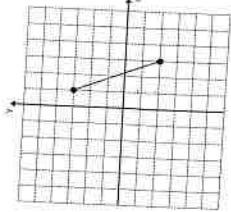
x	y
2	10
4	20
6	30

From Chapter 6

- 1) What is the slope of the line  $y = 2x + 3$ ?

$m = 2$  ✓

- 2) What is the slope of the following graph?



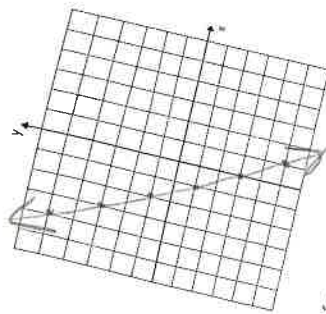
$m = \frac{5}{2}$  ✓

- 3) What is the slope of the line that passes through the points (3, 6) and (-1, 4)?

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 6}{-1 - 3} = \frac{-2}{-4} = \frac{1}{2}$  ✓

- 4) Graph the line  $2x + y = -3$ .

$y = -2x - 3$  ✓



- 5) Identify the slope and the coordinates of a point on the line of the equation  $y + 5 = -2(x - 4)$ .

$(4, -5)$  ✓

$m = -2$  ✓

$m = \frac{7-4}{3-1} = \frac{3}{2}$

- 6) Write an equation in the form  $y - y_1 = m(x - x_1)$  (slope/point form) for the graph of a linear function that passes through the points (1, 4) and (3, 7).

$y - 4 = \frac{3}{2}(x - 1)$  ✓

- 7) Write the equation of the line in the form  $y = mx + b$  (slope/intercept form) that has a y-intercept of 5 and is perpendicular to the line with an equation  $y = 2x + 3$ .

$y = -\frac{1}{2}x + 5$  ✓

- 8) Rewrite the equation  $3x + 2y - 6 = 0$  into the form  $y = mx + b$  (slope/intercept form).

$\frac{2y}{2} = \frac{-3x + 6}{2}$

$y = -\frac{3}{2}x + 3$  ✓

From Chapter 7

1) Is the point (2,3) a solution to the system below? (Why or why not?)

$$3x - 2y = 0$$

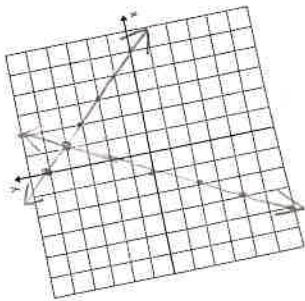
$$x = y - 1$$

$$3(2) - 2(3) = 0$$

$$6 - 6 = 0$$

$$y = 3 - 1$$

$$y = 2$$



2) Solve the following system using the Graphic Method.

$$y = 2x + 2$$

$$x + y = 5$$

$$y = -x + 5$$

Solution is  $(1, 4)$

$$2x + 3y = 11$$

$$y = 2x + 1$$

$$2x + 3(2x + 1) = 11$$

$$2x + 6x + 3 = 11$$

$$8x + 3 = 11$$

$$8x = 8$$

Solution is  $(1, 3)$

$$2 + 3(3) = 11$$

$$2 + 9 = 11$$

$$11 = 11$$

A) Solve the following system using the Elimination Method.

$$3x + 2y = 1$$

$$2(x - 3y) = -7$$

$$3x + 4 = -4$$

$$3x = -8$$

$$x = -\frac{8}{3}$$

$$11y = 22$$

$$y = 2$$

How many solutions (none, infinite, one) does the system have?

None

$$y = 2x + 3$$

$$y = 2x - 3$$

infinite

$$y = 2x + 4$$

$$y = 2x + 4$$

$$-2x + y = 4$$

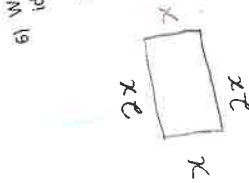
$$4x - 2y = -8$$

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

$$y = 4 + 2x$$

Word Problem: Write the linear system that would help you solve the problem. (Be sure to identify your variables with LET statements.) You do not need to solve the problem.

The perimeter of a rectangle is 150 cm. If the length is twice the width, find the length and width of the rectangle. Let  $x$  be the width.



$$6x = 150$$

$$x = 25 \text{ cm}$$

$$2x + 3(5) = 35$$

$$2x + 15 = 35$$

$$2x = 20$$

$$x = 10$$

Let adult ticket be  $x$   
Let child ticket be  $y$

$$2x + 3y = 70$$

$$-4x - 6y = 45$$

$$4x + 6y = 35$$

$$-2(2x + 3y) = -70$$

$$-4x - 6y = -70$$

$$-4x - 6y = 45$$

$$4x + 6y = 35$$

$$-5y = -5$$

$$y = 1$$