

# Linear Equations:

$$y = mx + b$$

Slope

y – intercept

(Change Amount)

(Starting Amount)

To Find Slope:  $m = \frac{(y - y)}{(x - x)}$

Ex: Write an equation of a line that goes through the points

(9, -3) and (4, 2)

1. Find the slope:

$$m = \frac{(-3 - 2)}{(9 - 4)} = \frac{-5}{5} = \boxed{-1}$$

2. Set up a skeleton equation.

$$y = mx + b$$

3. Find your “special b”

$$-3 = -1(9) + b$$

$$-3 = -9 + b$$

$$+9 \quad +9$$

$$\boxed{6 = b}$$

4. Write your final equation:

$$\boxed{y = -1x + 6}$$

Whenever you read the word

PARALLEL,

you should think

SAME SLOPE!!!

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Whenever you read the word

PERPENDICULAR,

you should think

OPPOSITE FLIP!!!

## Linear Equations Basic Review and Practice

Find the slope between the following sets of points.

1.  $(4, 3)$  and  $(-2, 9)$

2.  $(7, -1)$  and  $(0, 5)$

Write a slope-intercept equation from the given information.

3.  $m = 5$   $b = -4$

4.  $m = \frac{1}{2}$   $(4, -9)$

5.  $m = -3$   $(-2, 7)$

6.  $m = 4$   $(0, -5)$

7.  $(3, 5)$   $(4, -2)$

8.  $(9, -5)$   $(3, -1)$

9. Parallel to  $y = 3x + 7$  and through  $(2, 4)$

10. Perpendicular to  $y = -2x - 6$  and through  $(8, 5)$

## Linear Equations EOC Review and Practice

Choose the answer choice that BEST answers the question.

1. What is the equation of the line parallel to  $y = 4x + 7$  and goes through the point  $(-2, 0)$ ?

a.  $y = -1/4x + 8$

c.  $y = 4x + 8$

b.  $y = -1/4x - 2$

d.  $y = 4x + 7$

2. Sally babysits at her local Sports Center for a flat fee of \$25 per shift plus \$4 per kid. How much does she make on her shift if 8 kids show up?

a. \$25

c. \$29

b. \$32

d. \$57

3. A company charges \$7.50 shipping plus \$1.25 per item. How much is Martha charged for an order of 5 items?

a. \$13.00

c. \$13.75

b. \$14.25

d. \$15.00

4. What is the equation of the line perpendicular to  $y = 3/4x + 2$  and goes through the point  $(6, 3)$ ?

a.  $y = 3/4x + 11$

c.  $y = -3/4x - 5$

b.  $y = 4/3x - 5$

d.  $y = -4/3x + 11$

5. Which has a smaller slope?

**Line A** that goes through points  $(4, 3)$  and  $(-1, 2)$

**Line B** which is perpendicular to  $y = -5/2x + 7$

a. Line A

b. Line B

# Exponential Equations:

$$y = a(b^x)$$

Starting Amount

Growth/Decay

Percentage Rate

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**\*\*YOU MUST CONVERT  
PERCENTAGES TO DECIMALS!!!\*\***

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**Ex: Your parents give you \$500 when you are born. They put it in a savings account which has 3.5% annual interest. If you do not take any money out, how much money will be in the account on your 18<sup>th</sup> birthday?**

**Equation:  $y = 500(1.035)^x$**

**Answer:  $y = 500(1.035)^{18} = \$928.74$**

## Exponential Equations Basic Review and Practice

A particular type of bacteria splits into 2 every 30 minutes. There are 8 bacteria in the petree dish when you start your shift of looking after the culture.

1. Write an exponential function  $B(t)$  where  $t$  is the time periods elapsed and  $B$  is the number of bacteria.
2. How many bacteria are in the culture after 4 hours?
3. How many bacteria are in the culture after 7.5 hours?
4. How long was your shift if there are 8,192 bacteria in the dish when you leave?

You bounce a ball from a height of 20 feet. Every bounce the ball loses 20% of its height.

5. Write an exponential function  $h(t)$  where  $t$  is the number of times the ball bounces and  $h$  is the height of the ball.
6. What is the height of the ball after just one bounce?
7. What is the height of the ball after 10 bounces?
8. How many bounces has the ball bounced when it no longer reaches one foot?

## Exponential Equations EOC Review and Practice

Choose the answer choice that BEST answers the question.

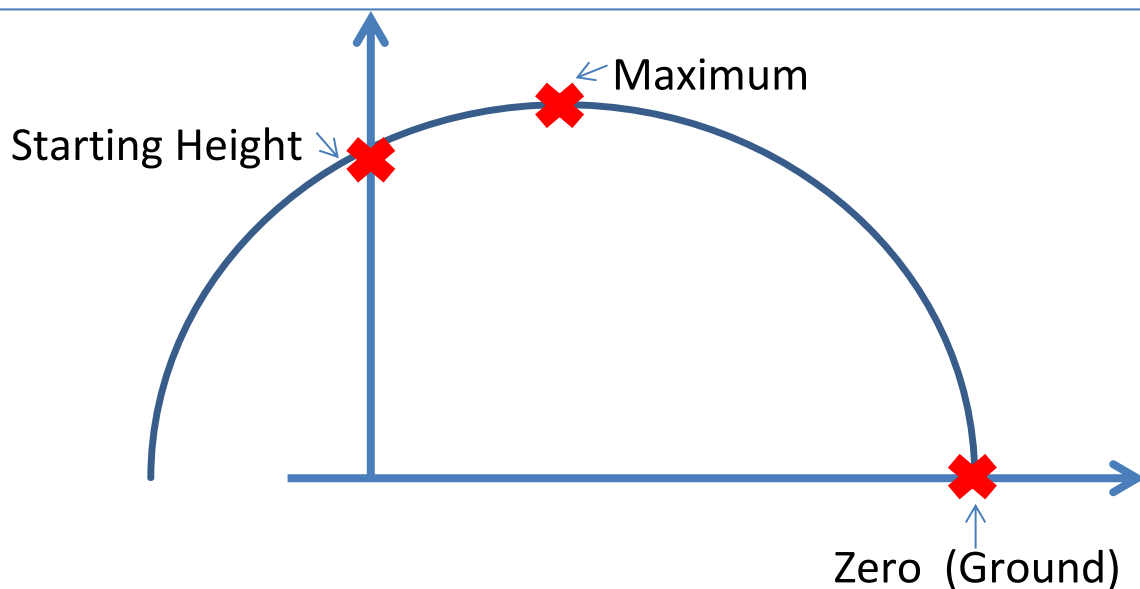
1. What is the  $y$  – intercept of the function  $y = 3(4^x)$ ?
  - a. 3
  - b. 7
  - c. 4
  - d. 12
2. What is the  $y$  – intercept of the function  $y = 5(.6^x) + 4$ ?
  - a. 5
  - b. 8
  - c. 6
  - d. 9
3. You deposit \$1,000 in the bank at 4.25% yearly interest. How much money do you have in the bank after 5 years?
  - a. \$1, 231.00
  - b. \$1,232.00
  - c. \$1,231.35
  - d. \$1,232.35
4. You take a pain killer to ease your headache. 85% of its strength remains after every hour. If you take 400mg at 12:00pm, when will less than 100 mg remain?
  - a. 8:00pm
  - b. 10:00pm
  - c. 9:00pm
  - d. 11:00pm
5. What is the half-life of a substance with the exponential decay function  $y = 4(.75^x)$  where  $x$  is time measured in years?
  - a. 1.8 years
  - b. 2.3 years
  - c. 2.5 years
  - d. 4 years

# Quadratic Equations:

$$y = ax^2 + bx + c$$



Starting Amount



**\*\*ZERO = ROOT = SOLUTION = ANSWER\*\***

**Ex:** You jump off of a 32 foot diving board with an upward velocity of 16 feet per second. Using the function  $h(t) = -16t^2 + v_0t + h_0$ , answer the following questions.

- After how many seconds do you hit the water?
- What is the maximum height you reach in your dive?
- At what time do you reach your maximum height?

**To use your calculator:**

2<sup>nd</sup>

Calc

2, 3, or 4

Take your cursor to the spot you want to calculate

Left x3 Enter

Right x6 Enter

Guess? Enter



## Quadratics Equations Basics Review and Practice

The function  $h(t) = -16t^2 + 32t + 240$  depicts the flight of a canon ball shot from 240 feet in the air with an initial velocity of 32 feet per second.

1. At what time does the canon ball hit the ground?
2. How high does the canon ball fly?
3. At what time does the canon ball reach its highest point?

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Suppose that the function  $V(t) = 25t^2 - 500t + 15000$  represents the value of a foreclosed house from the date of purchase in 1990 to the year 2008 when it was sold again after a big remodel.

4. What year did the house reach its lowest value?
5. What was the lowest value of the house?

## Quadratic Equations EOC Review and Practice

Choose the answer choice that BEST answers the question.

1. What are the solutions to the equation  $x^2 - 5x = 24$ 
  - a. (8, 3)
  - b. (8, -3)
  - c. (-8, 3)
  - d. (-8, -3)
2. What are the roots to the equation  $x^2 = -7x + 18$ ?
  - a. (-2, 9)
  - b. (-2, -9)
  - c. (2, -9)
  - d. (2, 9)
3. Apollo kicks a ball off the ground. After  $t$  seconds, its height,  $h$  (in feet) is given by the equation  $h = -16t^2 + 64t$ . At what time does the ball hit its maximum height?
  - a. 2 sec
  - b. 4 sec
  - c. 3 sec
  - d. 5 sec

A ball is thrown straight up into the air from the top of a building standing at 30 feet with an initial velocity of 55 feet per second. The height of the ball in feet can be modeled by the following function:

$$h(t) = -16t^2 + 55t + 30.$$

4. When does the ball reach the ground?
  - a. 2.5 sec
  - b. 4.2 sec
  - c. 3.9 sec
  - d. 5.3 sec
5. What is the maximum height reached by the ball?
  - a. 30 feet
  - b. 77 feet
  - c. 55 feet
  - d. 85 feet

# Non-Calculator Practice:

\*Use what you know from your time in class to solve the following problems **WITHOUT** a calculator!

## Non-Calculator Basic Review and Practice

1. Factor the expression  $x^2 + 3x - 54$ .
2. The lengths of the sides of a rectangular rug are 2 feet more than the widths. If Sammy decides to buy a new rug whose sides are all 4 feet longer than the original rug, write an expression that represents the area of the new rug?
3. The Sports Store sells 5 t-shirts and 10 pairs of shorts for \$132.50. The next day they sell 3 t-shirts and 5 pairs of shorts for \$69.50. What is the cost of a t-shirt?
4. The sum of three times Annabell's age plus her mother's age is 42. Her mother is 6 more than 6 times Annabell's age. How old is Annabell?

- 5.** The function  $C(m) = 5 + 2m$  represents the cost of renting  $m$  movies in a month from an internet video club. If Frances currently has only \$6, how much more money will Frances need to earn to rent 12 movies?
- 6.** Simplify the expression  $(x + 5)(x^2 + 2x - 6)$ .
- 7.** The difference of Grandma Annie's age and twice Carl's is 22. Grandma Annie's age is 13 less than 3 times Carl's. How old is Grandma Annie?
- 8.** Simplify the expression  $(4x - 3) - 2(3x + 6) - 4x(5)$
- 9.** The function  $h(t) = 150 - 4t$  represents the height of a person repelling down a building for the first time where  $t$  is measured in minutes and  $h$  is measured in feet above the ground. How high would the person be one half hour after beginning his descent?
- 10.** Factor  $100x^2 - 49y^4$

## Non-Calculator EOC Review and Practice

Choose the answer choice that BEST answers the question.

1. Which expression is equivalent to  $(3a^7b^2)^3$ ?

a.  $9a^{10}b^5$

c.  $27a^{10}b^5$

b.  $27a^{21}b^6$

d.  $9a^{21}b^6$

2. You sell candy bars for a fundraiser. Each box contains 50 bars and costs \$30. If you want to make \$45 profit for each box, how much should you sell each bar for?

a. \$1.00

c. \$1.50

b. \$1.25

d. \$2.00

3. Solve the equation  $D = mg$  for  $m$ .

a.  $m = D - g$

c.  $m = g - D$

b.  $m = g/D$

d.  $m = D/g$

4. What is the factored form of  $3x^2 - 18x - 48$ ?

a.  $3(x^2 - 6x - 16)$

c.  $3(3x^2 - 18x - 48)$

b.  $3(x + 2)(x - 8)$

d.  $3(x - 2)(x + 8)$

5. The amount of pairs of shoes sold each day at a shoe store is represented by the function  $S(h) = 10 + 7h$ , where  $h$  is the time measured in hours and  $S$  is the amount of pairs of shoes sold. What is the meaning of the slope?

a. 7 pairs are sold each hour.

c. 17 shoes are sold each hour.

b. 10 pairs are sold each hour.

d. 70 pairs are sold each hour.

# Statistics:

Mean ( $\bar{x}$ ) – Average

First Quartile ( $Q_1$ ) - Marks 25% and below

Median (med) - Middle number (when numbers are in order from least to greatest)

Third Quartile ( $Q_3$ ) - Marks 75% and below

Interquartile Range – difference between  $Q_3$  and  $Q_1$ .

Range - Difference between maximum and minimum numbers

Standard Deviation ( $S_x$ ) - measures the variation in the distribution

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## To Find Stats on your Calculator:

1.   Type in your list of data

2.

(Remember to scroll to get all of the information!)

## Statistics Basic Review and Practice

The Foods I Class surveyed 600 students in the school on what their favorite cereal was. The results are shown in the relative frequency table below.

	<b>Fruity Pebbles</b>	<b>Capt'n Crunch</b>	<b>Cocoa Puffs</b>	<b>Cheerios</b>
<b>Freshmen</b>	.15	.06	.02	.01
<b>Sophomores</b>	.20	.05	.04	.00
<b>Juniors</b>	.15	.03	.01	.02
<b>Seniors</b>	.15	.06	.03	.02

1. How many freshmen were surveyed?
2. How many more Sophomores were surveyed than Juniors?
3. How many students prefer Capt'n Crunch?
4. How many underclassmen (Freshmen and Sophomores) prefer Cocoa Puffs and Cheerios?

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Using the data below, find the particular data types asked.

**90, 85, 87, 92, 75, 86, 94, 95, 100, 88, 92**

5. Mean =
6. Median =
7. Interquartile Range =
8. Range =
9. Standard Deviation =
10. Mode =





## Answer Key

### Linears:

Basics

1.  $-1$

6.  $y = 4x - 5$

EOC

1. c

2.  $-6/7$

7.  $y = -7x + 26$

2. d

3.  $y = 5x - 4$

8.  $y = -2/3x + 1$

3. c

4.  $y = 1/2x - 11$

9.  $y = 3x - 2$

4. d

5.  $y = -3x + 1$

10.  $y = 1/2x + 1$

5. a

### Exponentials

Basics

1.  $B(t) = 8(2^t)$

6. 16 feet

EOC

1. a

2. 2048 bacteria

7. 2.15 feet

2. d

3. 262144 bacteria

8. 14 bounces

3. c

4. 5 hours

4. c

5.  $h(t) = 20(.80^t)$

5. b

### Quadratics

Basics

1. 5 sec

EOC

1. b

2. 256 feet

2. c

3. 1 sec

3. a

4. 2000

4. c

5. \$12,500

5. b

## Non-Calculator

Basics

1. $(x + 9)(x - 6)$	6. $x^3 + 7x^2 + 4x - 30$	EOC
2. $A = w^2 + 10w + 24$	7. 92 years old	1. b
3. \$6.50	8. $-22x - 15$	2. c
4. 4 years old	9. 30 feet	3. d
5. \$23	10. $(10x - 7y^2)(10 + 7y^2)$	4. b
		5. a

## Statistics

Basics

1. 144	6.90	EOC
2. 48	7. 8	1. b
3. 120	8. 25	2. c
4. 42	9. 6.5	3. a
5. 89.45	10. 92	