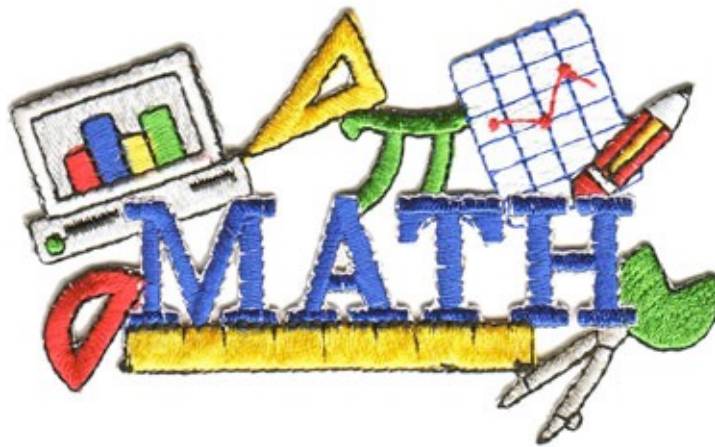# 8th Grade Math

Benchmark 2

Parent Handbook

This handbook will help your child review material learned this quarter, and will help them prepare for their second Benchmark Test. Please allow your child to work independently through the material, and then you can check their work using the answer key in the back of the handbook. If you have any questions or concerns about this material, please contact your child's teacher. Thank you for your support.

Eighth Grade Benchmark #2
Math Essential Standards

Learning Objective #1:
- **"Fluently solve linear equations and inequalities with one variable." (8.M.EE.C.07)**

Practice:
1. From the given equation, determine which line holds the error.
   Equation: 118 + x = 4(22 - x)

   Line 1: 118 + x = 88 - 4x
   Line 2: 118 = 88 - 5x
   Line 3: 30 = -5x
   Line 4: x = -6

   a. Line 1: - 4x is an incorrect simplification
   b. Line 2: - 5x is an incorrect simplification
   c. Line 3: 30 is an incorrect simplification
   d. There are no errors in the problem.

2. Solve **2(x - 8) = 6(2x - 12)**

3. Solve **2(x - 7) > -x + 13**

4. Solve & Graph. **-2 < 4p + 6 + 4**

Learning Objective #2:

📌 **"Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways." (8.M.EE.B.05)**

Practice:

5. Find the rate of change in the following linear function and interpret its meaning.

Fundraiser Profits
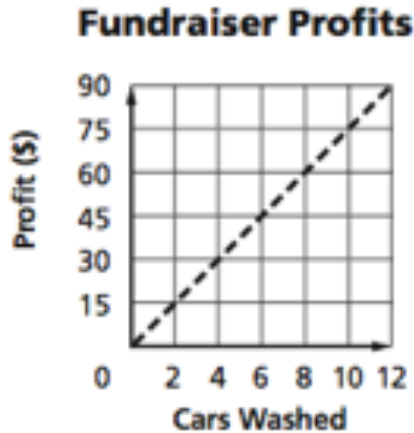
$15.00 profit for each car washed

$7.50 profit for each car washed

$30.00 profit for every 3rd car washed

$45.00 profit for every 4th car washed

6. Find the rate of change in the following linear function and interpret its meaning.

Width (ft)	Height (in.)
x	y
2	10
4	14
6	18
8	22

a. 5 in height to 1 in width

b. 3 in height to 1 in width

c. 4 in height to 1 in width

d. 2 in height to 1 in width

7. The cost of paper varies directly with the number of reams bought. Suppose 2 reams costs $5.10. Write a linear equation that could be used to find the cost of *x* reams of paper. Find the cost of 15 reams of paper.

Equation: _____

15 Reams of Paper Costs: _____

Learning Objective #3:

   "Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)." (8.M.F.A.02)
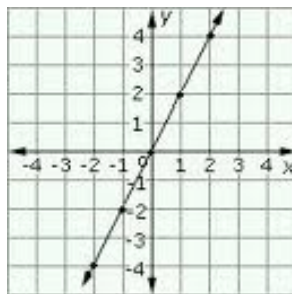
Practice:

Compare the functions below and answer the following questions.

FUNCTION 1   **FUNCTION 2**

X	Y
0	3
2	5
4	7
6	9

8. Which function has the greatest rate of change?

   _____

9. Which function has the lowest y-intercept?

   _____

10. Which function shows a negative slope?

   _____

11. Beth is joining a gym. Her registration fee is $100 and then $25 per month. Her friend Jamie joined a different gym and had to pay $50 for her registration fee and pays $40 per month. After 1 year, who pays the least amount of money?

   _____

Learning Objective #4:

"Given a description of a situation, generate a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or a graph. Track how the values of the two quantities change together. Interpret the rate of change and initial value of a linear function in terms of the situation it models, its graph, or its table of values." (8.M.F.B.04)
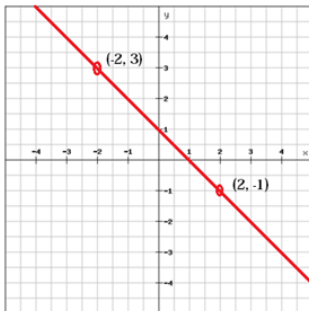
Practice:

12. Which linear equation represents the table below?

Y
5
30
35
-5

X	Y
-2	-6
-1	-5
0	-4
1	-3

a. $y = x - 1$
b. $y = x + 4$
c. $y = -x - 4$
d. $y = x - 4$

X	Y
-1	-4
-2	-8
-3	-12
-4	-16

13. Which linear equation represents the graph below?

(-2, 3)
(2, -1)

Y
-6
4
19
39

a. $y = x + 1$
b. $y = -x - 1$
c. $y = -x + 1$
d. $y = x - 1$

14. Logan has $950 in his bank account. Every month he spends $75. He does not add money to the account. Which linear equation represents this situation?
   a. $y = -75x + 950$
   b. $y = 75x - 950$
   c. $y = -75x - 950$
   d. $y = 75x + 950$

Y
-3
-4
-5
-6

X	Y
0	-5
3	13
8	43
10	55

15. Write the equation of the line through the following pair of points:
   (-6, -11) (2, -5)

Learning Objective #5:

🖈 **"Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear." (8.M.F.A.03)**

Practice:

16. The graph of a linear function is a _____?
   a. parabola
   b. asymptote
   c. curve
   d. line

17. Which scenario does not represent a linear function?
   a. A phone plan costs $50 a month and $.25 per text.
   b. Jon rents a Rug Doctor it costs $30 plus $5 for every day it is late.
   c. You buy a printer for $100 and the ink cartridges cost $25 each.
   d. A baseball is hit into the air at a speed of 90 mph. The equation for the ball's
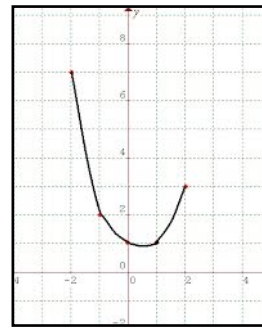   height is $f(x) = -5x^2 + 38.7x + 25.5$

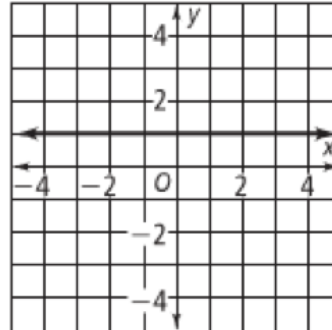**Identify each graph as a linear or nonlinear function.**

18. _____   19. _____
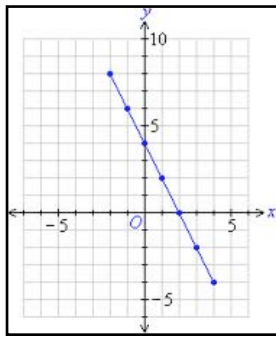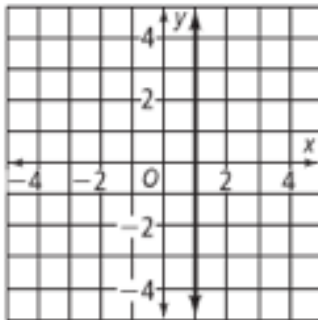
20. _____   21. _____

Benchmark 2 Essential Math Vocabulary

✦ **linear equation** - an equation in which the highest power of any variable is one and when graphed forms a straight line.

✦ **inequality** - a mathematical statement that says two expressions are   not equal.

✦ **proportional relationship -** a relationship between two quantities in which the two quantities vary directly with one and other.

✦ **rate of change -** a ratio between a change in one variable relative to a corresponding change in another.

✦ **slope-intercept form -** a written form of a linear equation, $y = mx + b$,where m is the slope and b is the y-intercept.

✦ **slope** - the measure of steepness of a line; represented by "m" in y-intercept form.

✦ **y-intercept** - the coordinate at which the graph of a line intersects the y-axis; represented by the "b" in y-intercept form.

✦ **compare -** to examine two or more quantities, or representations such as graphs, tables, charts, etc. and determine similarities and differences.

✦ **input/output table -** a table that lists independent (x) values and corresponding dependent (y) values.

✦ **graph -** a diagram showing the relation between variable quantities

✦ **order** - arranging numbers in a well-defined manner.

✦ **ordered pair -** two numbers used to show the position on a graph where the "x" (horizontal) value is first, and the "y" (vertical) value is second written in parentheses like this: (4,5).

✦ **estimate** - an answer that is close to the exact answer and is found by rounding, clustering, using front-end digits, compatible numbers, or another method to find an approximate answer.

✦ **equation** - a statement that the values of two mathematical expressions are equal.

✦ **function** - a rule that defines a relationship between two sets of numbers in that for each value of the independent variable set there is only one value in the dependent variable set.

✦ **linear function** - a function that has a constant rate of change and can be modeled by a straight line.

✦ **nonlinear function -** a function that cannot be modeled as a straight line.

MATH ANSWER KEY

1. D

2. x = 5.6

3. x > 9

4. p > -3 or -3 < p

5. B

6. D

7. y = 2.55x ; $38.25

8. Function 2

9. Function 2

10. Neither

11. Beth

12. D

13. C

14. A

15. $y = \dfrac{3}{4}x - \dfrac{13}{2}$ OR $y = .75x - 6.5$

16. D

17. D

18. linear

19. nonlinear

20. linear

21. linear