# Meaning and Changes of m & b

## Agenda
Warm-Up

Notes - 3

Stations

HW: Practice #1-7

`00:00 00`

## Reminders
Algebra 1 STAAR May 6th!

Defeat EOC book due May 8

# Warm-Up FRIDAY
Have your HW and Defeat the EOC book out

**Solve for y!**

1. Which inequality is equivalent to $7x - 2y > 8$?

*divide by neg → flip sign*   $-7x$   $-7x$

~~y > $\frac{7}{2}x + 8$~~

**H**   $y < \frac{7}{2}x - 4$   $\frac{-2y}{-2} > \frac{-7x+8}{-2} \frac{}{-2}$

~~$y > -\frac{2}{7}x + \frac{8}{7}$~~   **J**   $y < -\frac{2}{7}x - \frac{4}{7}$   $\boxed{y < \frac{7}{2}x - 4}$

2. The graph of line $p$ represents $y = \frac{1}{5}x - 1$. If the slope of line $p$ is multiplied by $-10$ to create line $r$, which statement about the graphs of the two lines is true?

$\frac{1}{5}(-10) = -2$    $y = -2x - 1$

**A**   Line $r$ intersects line $p$.   ~~**C**~~   Line $r$ is 10 units above line $p$.

~~**B**~~   Line $r$ is parallel to line $p$.   ~~**D**~~   Line $r$ is 10 units below line $p$.

Practice

1. Which equation describes the line that passes through the point $(4, 7)$ and is parallel to the line represented by the equation $-3x + y = 4$?

　A　$y = -3x + 19$

　B　$y = 3x - 5$

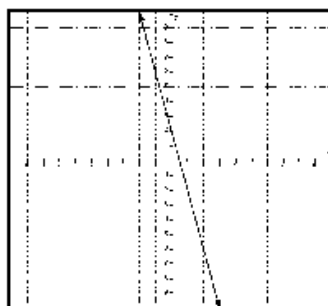　C　$y = \frac{1}{3}x + 5\frac{2}{3}$

　D　$y = -\frac{1}{3}x + 8\frac{1}{3}$

2. Write a function in slope-intercept form that represents a line that contains the point $(2, 12)$ and has a slope of -3?

*(handwritten)*
$y = mx + b$
$12 = -3(2) + b$
$12 = -6 + b$
$\quad +6 \quad +6$
$18 = b$

$\boxed{y = -3x + 18}$  *x y*

*not → y-int*

3. Which inequality best represents the graph shown below?

　A　$x + 4y \geq 8$

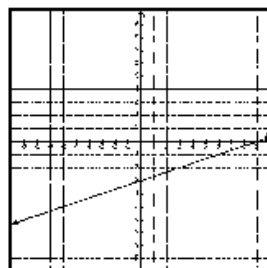　B　$4x + y \geq 2$

　C　$4x + y < 2$

　D　$x + 4y \leq 8$

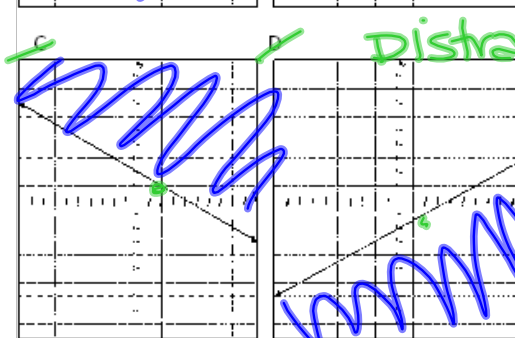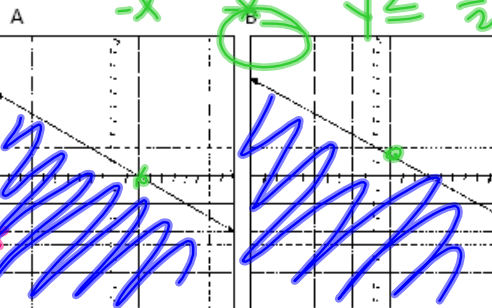4. Which function includes the data set $(-2, 7), (4\ 4), (6, 3)$ ?

　A　$y = -\frac{1}{2}x + 6$　　B　$y = -2x + 3$

　C　$y = \frac{1}{2}x + 8$　　D　$y = 2x - 4$

5. What are the intercepts of the linear function shown below?

　A　$(-3, 0)$ and $(9, 0)$

　B　$(-3, 0)$ and $(0, 9)$

　C　$(0, -3)$ and $(0, 9)$

　D　$(0, -3)$ and $(9, 0)$

6. Which of the graphs below best represent the inequality $x + 2y < 4$?

*(handwritten)*
$2y \leq -x + y$
$-x$
$y \leq -\frac{1}{2}x + 2$
Distractor

　A　　　　　　B

　C　　　　　　D

7. The table below shows various values for $x$ and $y$. Which equation best describes the relationship between $x$ and $y$?

　A　$y = -3x + 5$

　B　$y = -5x - 7$

　C　$y = -x + 17$

　D　$y = 3x + 41$

| $x$ | $y$ |
| --- | --- |
| -6 | 23 |
| -2 | 3 |
| 7 | -42 |
| 11 | -62 |

8. Which function includes the following set of ordered pairs $(1, 3), (2, 0), (3, -3)$ ?

　A　$y = -3x$　　　C　$y = -3x + 6$

　B　$y = \frac{-x}{3}$　　　D　$y = -\frac{x}{3} - 4$
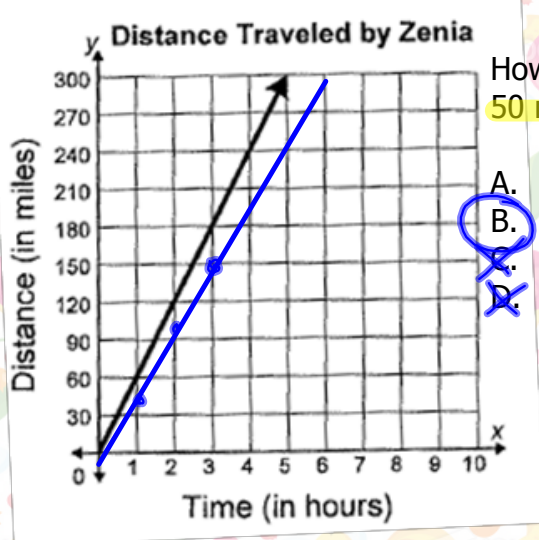
# Meaning and Changes of m & b

| Key words for SLOPE | Key words for y-intercept |
|---|---|
| • Rate of change (m) <br> ex. speed (mph) <br> • PER | • beginning (b) <br> • Starting   ex. Flat fee <br> • initial   (one time charge) |

## Teach Piece (Problem #1)

The graph below shows the relationship between the number of hours Zenia travels at a rate of 60 miles per hour and the distance she travels.



**SLOPE**

How would the graph change if the rate were 50 miles per hour rather than 60 miles per hour?

A. The graph would be steeper.
B. The graph would be less steep.
C. The y-intercept of the graph would be greater.
D. The x-intercept of the graph would be greater.

$60 \Rightarrow 50$

| these are WRONG Because... | this is cORRect Because... |
|---|---|
| D. we changed slope not x-inf. <br> C. doesn't change! <br> A. slope decreased, not increased. | B. 50 < 60 (slower) less steep! |

# Meaning and Changes of m & b

You will have 4 minutes at each station. (2-6)

- Write down important parts of the problem (what you would highlight/underline)
- Write why each incorrect answer choice is wrong.
- Explain why the correct answer is right.

00:00 00

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## Station 2

The amount an appliance repairman charges for each job is represented by the function $t=50h + 35$, where $h$ represents the number of hours he spent on the job and $t$ represents the total amount he charges in dollars for the job. The repairman plans to change the amount he charges for each job. The amount he plans to charge is represented by the function $t=50h + 45$.

What will be the effect of this change on the amount he charges for each job?

A The total amount he charges for each job will increase by $10.

B The total amount he charges for each job will decrease by $10.

C The amount he charges per hour will increase by $10.

D The amount he charges per hour will decrease by $10.

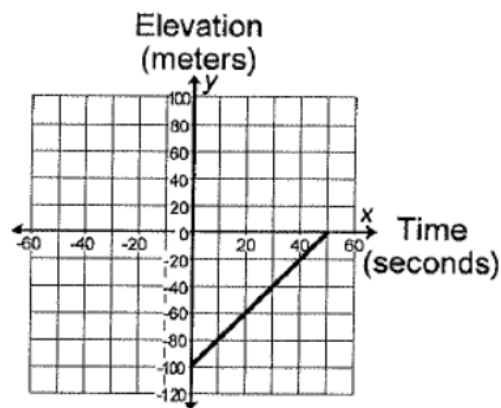Algebra I - Unit 11: End of Course Review - Meaning and Changes in $m$ & $b$
## Station 3

Mrs. Smith calls an air conditioner repair company. She finds out that a service technician charges $35 to detect the problem and $20 every 15 minutes thereafter to repair the problem. The cost of repairing Mrs. Smith's air conditioner is calculated using the function $f(m) = 35 + 20m$, where $m$ represents the number of 15-minute intervals the technician works repairing the problem and $f(m)$ represents the total charge of working on the air conditioner. If the number of 15-minute intervals is graphed on the $x$-axis and the cost is graphed on the $y$-axis, which of the following is represented by the $y$-intercept of this graph?

A. The number of 15-minute intervals the technician work on the air conditioner

B. The flat rate the technician charges to detect the problem

C. The total charge for fixing the air conditioner

D. The amount the technician charges for every 15-minute interval

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## Station 4

A submarine that operates at a depth of 100 meters is ascending at a constant speed of 2 meters per second. The graph shows the relationship between the time in seconds and the elevation of the submarine. What does the *x*-intercept of this graph represent?

Elevation (meters)



A. The number of seconds the submarine is submerged before it begins its ascent.

B. The speed at which the submarine ascends.

C. The number of seconds it takes the submarine to reach the surface of the water.

D. The elevation of the submarine when it begins its ascent.

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Station 5

A line has the equation $y = 3x - 7$. If the slope of the line is doubled and 5 is added to the $y$-intercept, which equation represents the new line?

A. $y = 6x - 12$
B. $y = 6x - 2$
C. $y = 6x + 2$
D. $y = 8x - 14$

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## Station 6

Geothermal energy is transferred from heated rocks below the earth's surface to water when water comes into contact with the rocks. The formula $t(d) = 25d + 17$ can be used to estimate the Celsius temperature, $t(d)$, of a rock when the rock is at a depth of $d$ kilometers below the earth's surface. If the depth, in kilometers, of the rock is graphed on the $x$-axis and the temperature, in degrees Celsius, of the rock is graphed on the $y$-axis, which of the following is represented by the slope of this graph?
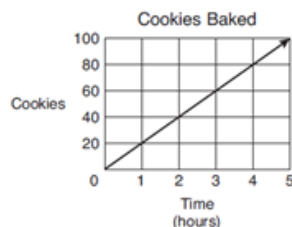
A. A rate of change of $17°C$ for every kilometer of depth

B. A temperature of $25°C$ at the earth's surface

C. A rate of change of $25°C$ for every kilometer of depth

D. A temperature of $17°C$ at the earth's surface

Practice

1. The business manager at Affordable Plumbing calculates the total cost, $c$, to a customer by using the equation $c = 62h + 38$, where $h$ is the number of hours of work performed. The business manager at Leak Free Plumbing calculates the total cost, $c$, to a customer by using the equation $c = 58h + 45$, where $h$ is the number of hours of work performed. How does the graph of the equation used by Affordable Plumbing compare to the graph of the equation used by Leak Free Plumbing?
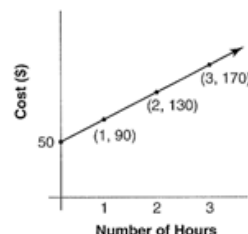
    A   The slope is the same, and the $y$-intercept is greater.
    B   The slope is greater, and the $y$-intercept is smaller.
    C   The slope is smaller, and the $y$-intercept is the same.
    D   The slope is greater, and the $y$-intercept is greater.

2. Mark and his friends are baking cookies for a bake sale. The graph below shows the total number of cookies they have compared to the number of hours they bake. How would the graph change if Mark and his friends were given 20 cookies when they started baking?

**Cookies Baked**



A The $y$-value of the $y$-intercept would increase.

B The slope would increase.

C The $y$-value of the $y$-intercept would decrease.

D The slope would decrease.

3. Find the $x$- and $y$- intercepts of $2x + y = -5$.

An electrician charges a flat fee of $50 plus an hourly rate to make a house call. The graph shows the total cost for a job based on the flat fee and the number of hours to complete the job.



4. If the electrician changed his flat fee to $60, but kept his hourly rate the same, what would be the total charge for a job that took 3 hours?

5. If the electrician left his flat fee at $50, but changed his hourly rate to $45, what would be the total charge for a job that took 3 hours?

6. If the electrician changed his flat fee to $60 and changed his hourly rate to $45, what would be the total charge for a job that took 3 hours?

7. Which best describes the change in the graph of the function $f(x) = 5x + 4\frac{1}{4}$ if the $y$-intercept is changed to $7\frac{1}{2}$, while the slope remains constant?

    A   The line shifts up $2\frac{1}{2}$ units

    B   The line shifts to the right $3\frac{1}{4}$ units

    C   The line shifts up $3\frac{1}{4}$ units

    D   The line shifts down $2\frac{1}{2}$ units.