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## Warmup 10/(Add the first 4 digits of pi together)

 FOR EACH: Find the constant rate of change. Also, find the "original amount" if there is one.1) 

| Minutes | Sentences |
| :---: | :---: |
| 6 | 90 |
| 9 | 105 |
| 12 | 120 |

$15 \quad 135$

Rate of change
$=5$ sentences per minute
Original amount $=\mathbf{6 0}$ sentences

| 2) | Age |
| :---: | :---: |
| 7 | Weight (lbs) |
| 7 | 28 |
| 8 | 32 |
| 9 | 36 |
| 11 | 44 |

Rate of change
$=4$ pounds per year
Original height $=0$ in

| 3$)$ | Age | Height (in) |
| :---: | :---: | :---: |
|  | 3 | 4.5 |
| 4 | 6 |  |
| 5 | 7.5 |  |
| 6 | 9 |  |

Rate of change
$=1.5$ inches per year
Original height $=0$ in

## Honorable Mentions: October $9^{\text {th }}$

- Jasmyn M: Most used number in one of Prince's most popular songs
- Brea H: Number of letters in our school's mascot


## VOLUNTEER

- Collect the unused restroom passes from everyone and put them in the tray
- Piece of candy if you didn't use any!
- Smaller reward if you used some but not all (still thinking about what this is)


## NEW Restroom Passes

- Write your name on it right now!!!
- I prefer you do not cut them off.
- Non-transferrable.
- These must be used for drink passes as well.
- If you run out and still need to use one, you need to do 15 extra minutes of ALEKS that weekend. If you don't, you will come in to do it at lunch.


## Linear Quiz Retake...

- MUST stay after school today or tomorrow.
- You should let me know in advance if you're coming!

| Minutes | Sentences | Age | Weight (lbs) | Age | Height (in) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 6 | 90 | 7 | 28 | 3 | 4.5 |
| 9 | 105 | 8 | 32 | 4 | 6 |
| 12 | 120 | 9 | 36 | 5 | 7.5 |
| 15 | 135 | 11 | 44 | 6 | 9 |
| $y=5 x+60$ |  | $y=4 x$ |  | $y=1.5 x$ |  |

## Proportional Relationships

- A proportional relationship is a special kind of linear relationship.
- Proportional: If it is linear AND the original value (y-intercept) is 0 .
- Proportional: $\mathbf{y}=\mathrm{mx}$ (no b!!!)
- If $\frac{\text { change in } y}{\text { change in } x}$ is constant, it is linear.
- If $y \div x$ is also constant, it is proportional.


## NOT PROPORTIONAL!!!



- It is impossible to be proportional but not linear.


## Write an equation in slope-intercept form.

| Weeks | Books Read |
| :---: | :---: |
| 10 | 11 |
| 20 | 22 |
| 30 | 33 |
| 40 | 44 |

Rate of change $=1.1$ books per week
(Jim Kwik says this is about how many books CEOs read)

Original amount $=0$ books

$$
y=1.1 x
$$

Proportional!

## Write an equation in slope-intercept form.

| Years | Weight (lbs) |
| :---: | :---: |
| 6 | 31 |
| 10 | 47 |
| 14 | 63 |
| 18 | 79 |

Rate of change $=4 \mathrm{lbs} /$ year
Original weight $=7 \mathrm{lbs}$

$$
y=4 x+7
$$

Linear but not proportional

## Write an equation in slope-intercept form.

| Minutes | Meigs Moolah <br> signed | Rate of change $=12$ MM per minute |
| :---: | :---: | :---: |
| 2 | 24 | Original amount $=0$ |
| 5 | 60 |  |
| 7 | 84 | $\mathrm{y}=12 \mathrm{x}$ |
| 8 | 96 |  |
|  |  | Proportional! |

## Write an equation in slope-intercept form.

| Years | Height |
| :---: | :---: |
| 2 | $2^{\prime} 10^{\prime \prime}$ |
| 4 | $3^{\prime} 4^{\prime \prime}$ |
| 7 | $3^{\prime} 10^{\prime \prime}$ |
| 11 | $4^{\prime} 6^{\prime \prime}$ |

Not a constant rate of change!!!
2 to 4: 3 inches per year
4 to 7: 2 inches per year
Not possible to write $a y=m x+b$ equation.

## Write an equation in slope-intercept form.

| Minutes | Problems left | Rate of change $=-3$ problems per minute |
| :---: | :---: | :--- |
| $\mathbf{3}$ | 74 |  |
| $\mathbf{5}$ | $\mathbf{6 8}$ | Original amount $=83$ |
| 7 | $\mathbf{6 2}$ |  |
| $\mathbf{8}$ | $\mathbf{5 9}$ | $\mathrm{y}=-3 \mathrm{x}+83$ OR $\mathrm{y}=83-3 \mathrm{x}$ |
|  |  |  |

## HOMEWORK (Due tomorrow)

- Worksheet: Writing Equations from a Table

