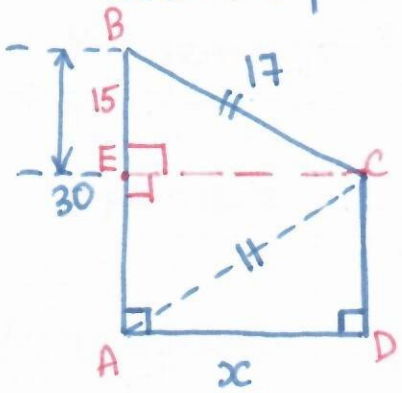
Tuesday, Sept 10, 2019

Warm Up.



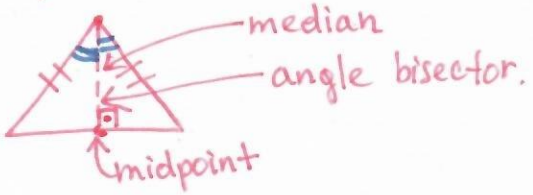
label the key points ✓

$\triangle ABC$ isosceles ✓ $(BC = AC)$

perform an auxiliary construction.
(additional, supplementary)
↳ introduce (draw in)
something extra.

$EC \parallel AD$, $EC = AD = x$

$BE = EA = \frac{1}{2}(30) = 15$



In a RAT, $\triangle EBC$
Pythagorean Th.

$17^2 = 15^2 + x^2$

$289 = 225 + x^2$

$x^2 = 289 - 225$

$x^2 = 64$

$x = \pm\sqrt{64} \rightarrow 8$, $x = \pm 8$, $x > 0$ (length)

because $(8)^2 = 64$ $\therefore$ $\boxed{x = 8}$

$(-8)^2 = 64$

Three painters will do a job in 5 days.
How long will it take 5 painters to complete the same job?

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3 painters: $\frac{1}{5}\frac{\text{job}}{\text{day}}$

Assumption: all painters work at the same rate

1 painter: $\frac{1}{3 \cdot 5} = \frac{1}{15}\frac{\text{job}}{\text{day}}$

5 painters: $\frac{5}{15} = \frac{1}{3}\frac{\text{job}}{\text{day}}$.

$$\text{time} = \frac{\text{job}}{\text{work rate}} = \frac{1\ \text{job}}{\frac{1}{3}\frac{\text{job}}{\text{day}}} = 3\ \text{job} \cdot \frac{\text{day}}{\text{job}} = 3\ \text{days}.$$

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25 workers: $\frac{1}{20}\ \frac{\text{field}}{\text{day}}$.

1 workers: $\frac{1}{20 \cdot 25} = \frac{1}{500}\ \frac{\text{field}}{\text{day}}$.

10 workers: $\frac{10}{500} = \frac{1}{50}\ \frac{\text{field}}{\text{day}}$.

Job = (time)(rate of work)

$\text{Job} = \left(\frac{75}{2}\ \text{days}\right)\left(\frac{1}{50}\ \frac{\text{field}}{\text{day}}\right) = \frac{75}{100} = \frac{3}{4}$ field.

$1 - \frac{3}{4} = \frac{1}{4}$ field to be done by 25 workers initially.

$$\text{time} = \frac{\text{Job}}{\text{work rate}} = \frac{\frac{1}{4}}{\frac{1}{20}} = \frac{20}{4} = 5 \text{ days}.$$

Linear Relations.

Relation: independent variable, x — horizontal axis →

dependent variable, y — ↑ vertical axis.

$y = mx + b$ ← y-intercept ($x=0$)

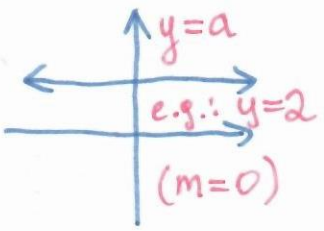
↑ location where the graph crosses the y-axis.

- slope: rise over run, $\frac{\Delta Y}{\Delta x}$, rate of change of y with respect to x
- measure of steepness / incline
- indicator of orientation of the line.

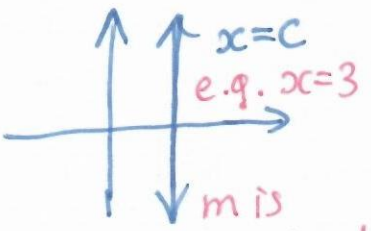
$$m = \frac{\Delta Y}{\Delta X} = \frac{Y_2 - Y_1}{x_2 - x_1}$$ ← match!

Lines:

A: Horizontal lines

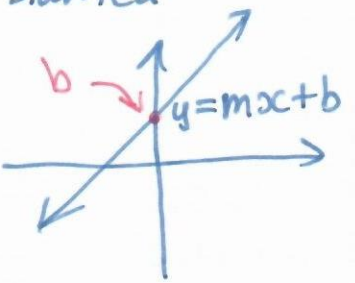


B: Vertical lines

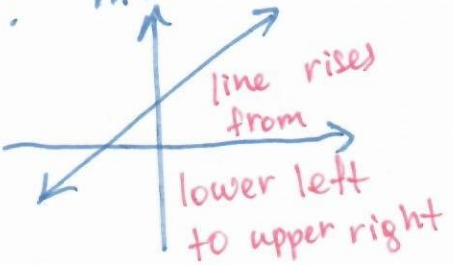


m is undefined

C: Slanted

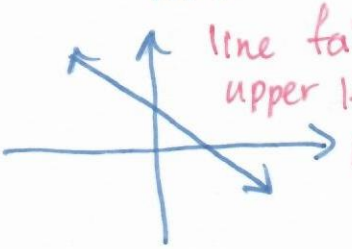


C_1: $m > 0$



line rises from lower left to upper right

C_2: $m < 0$



line falls from upper left to lower right.