

Honors Precalculus with Trigonometry (OM013)
Problem Set 2Name: Pranav Ananth

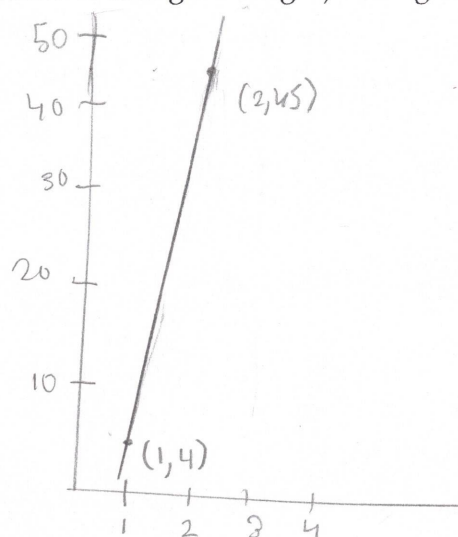
Please show all work because you will be graded on the clarity of your explanation as well as the correctness of your work. An answer with no work/explanation will receive zero credit.

1. A ball thrown straight upward from a height of 4ft with an initial velocity of 57ft per sec has height $h(t)$ feet after t seconds, where $h(t) = -16t^2 + 57t + 4$. What is the ball's average velocity (that is, its average rate of change in height) during the first second?

$$h(t) = -16t^2 + 57t + 4$$

$$h(0) = -16(0)^2 + 57(0) + 4$$
$$= 4$$

$$h(1) = -16(1)^2 + 57(1) + 4$$
$$= -16 + 57 + 4$$
$$= 45$$



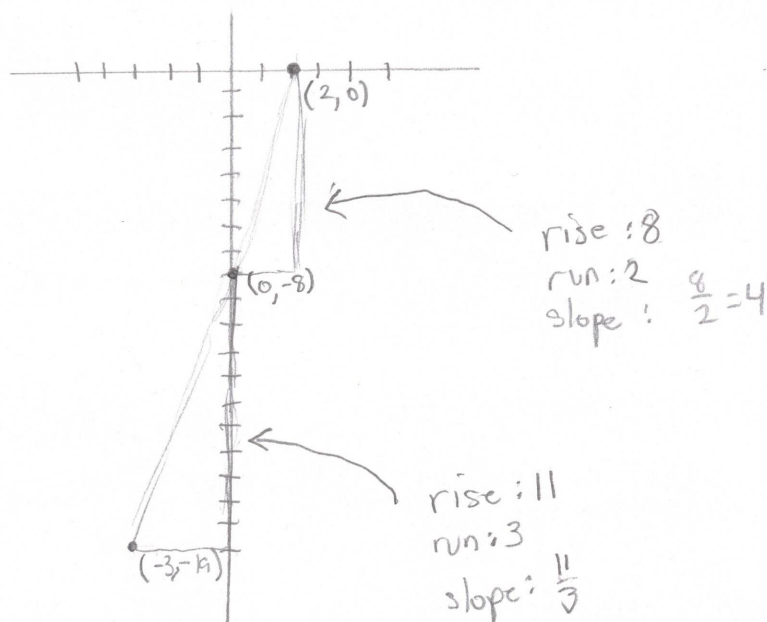
$$\frac{\text{rise}}{\text{run}} = \frac{45 - 4}{2 - 1} = 41$$

The ball's average velocity in the first second is 41 feet/sec.

2. Determine whether the following three points are collinear:

$(0, -8)$, $(-3, -19)$ and $(2, 0)$

If they are collinear,
they need to have the same
slope from point 2 \rightarrow point 1
and point 1 \rightarrow point 3.

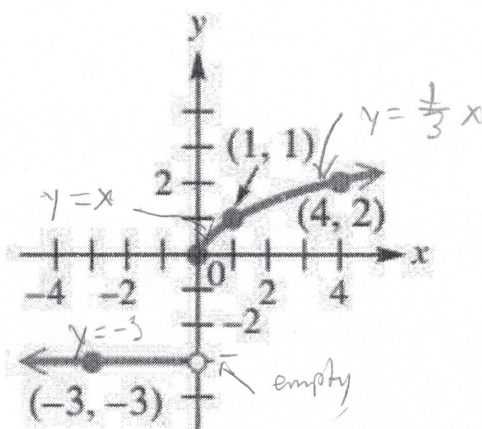


$$4 \neq \frac{11}{3}$$

They are not collinear.

3.

Give a rule for the piecewise-defined function shown below. Also provide its domain and range.



$$f(x) = \begin{cases} -3 & \text{if } x < 0 \\ x & \text{if } x \in [0; 1] \\ \frac{1}{3}x + \frac{2}{3} & \text{if } x > 1 \end{cases}$$

domain is $(-\infty; \infty)$

range is $\{-3\} \cup [0; \infty)$