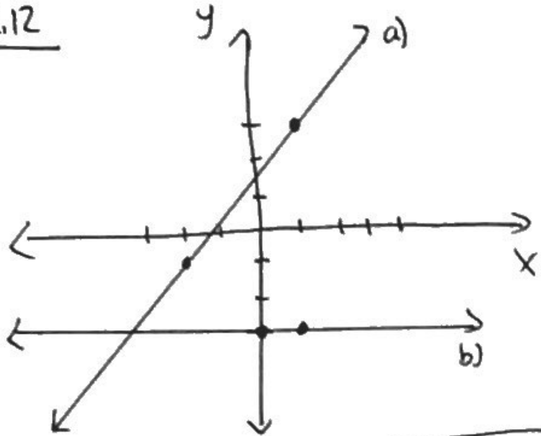
MA202 HW19 Solutions | 15.2: #12, 16, 18, 22, 26, 28, 30, 32, 34, 38, 40, 44

15.2.12



Plot the given point and use slope = rise/run to get another point on the line.

15.2.16 a) Use (1, 60) and (0, 0).

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{60-0}{1-0} = \boxed{60 \text{ mph}}$$

b) The slope is relating the change in distance to the change in time, so it is a speed.

15.2.18 a) A line parallel to the given line also has slope $-\frac{2}{5}$. b) A line perpendicular to the given line has slope $\frac{5}{2}$.

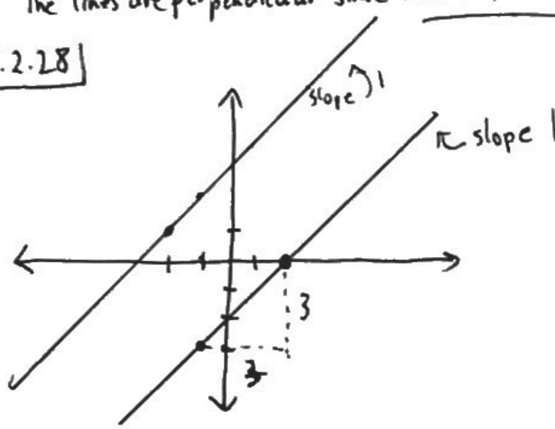
15.2.22 Slope of first line: $\frac{6-5}{-2+4} = \frac{1}{2}$ slope of second line: $\frac{3-2}{-6+3} = \frac{1}{-3}$

The lines are not parallel since they have different slopes.

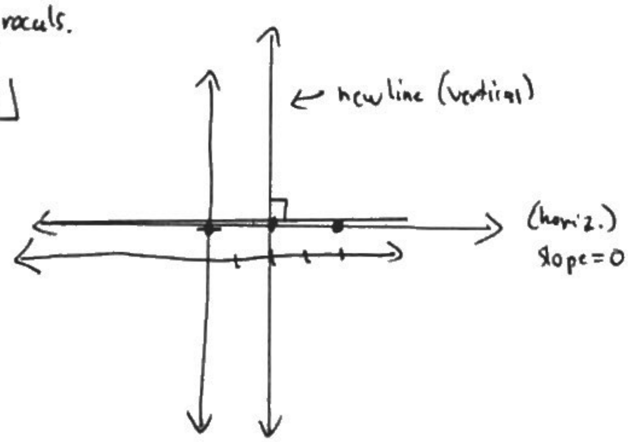
15.2.26 Slope of first line: $\frac{3-0}{3+1} = \frac{3}{4}$ slope of second line: $\frac{-1-3}{5-2} = \frac{-4}{3}$.

The lines are perpendicular since their slopes are negative reciprocals.

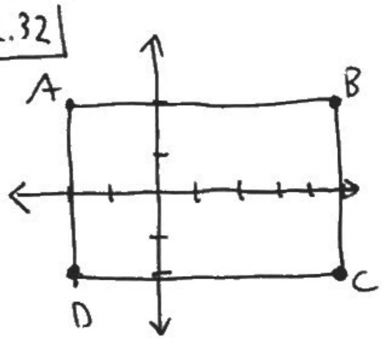
15.2.28



15.2.30

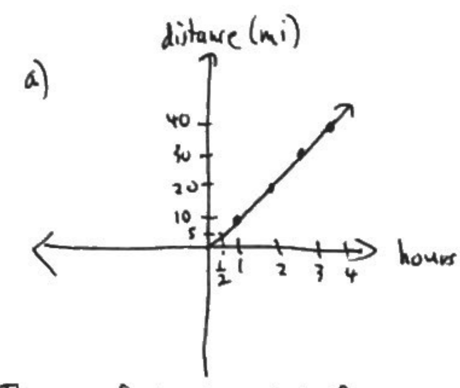


15.2.32



AB, CD are horizontal, slope 0, ~~with length~~ BC, AD are vertical. So AB is perpendicular to BC, AD and so is CD. Hence all 4 angles are 90°, so ABCD is a rectangle.

15.2.34 a)



b) The slope of the line in a) is 10.

c) It takes $\frac{1}{2}$ hour to go 5 miles at a rate of 10 mph.

15.2.38 | Compute the slopes of the lines between pairs of points: 464

- $(-4,6)$ and $(0,4)$: slope $= \frac{4-6}{0+4} = -\frac{2}{4} = -\frac{1}{2}$

- $(0,4)$ and $(2,2)$: slope $= \frac{2-4}{2-0} = -\frac{2}{2} = -1$

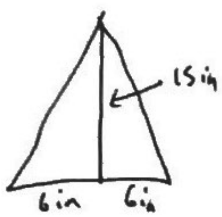
Since these slopes are different, the points are not collinear (don't lie on the same line).

15.2.40 |

a) Given $(2,4)$, $(5,3)$:
The slope of the line between these points is $\frac{3-4}{5-2} = -\frac{1}{3}$, so $(-1,5)$ and $(8,2)$ are also on the line.

b) Given $(-6,-3)$, $(4,-3)$
The slope of the line between these points is 0, so $(0,-3)$ and $(47,-3)$ are also on the line.

15.2.44 |



The left slope is $\frac{15}{6} = \frac{5}{2}$, using the idea that slope is rise over run.
The right slope is $\frac{-15}{6} = -\frac{5}{2}$.