Math 10

Lesson 4–2 Answers

Lesson Questions

Question 1

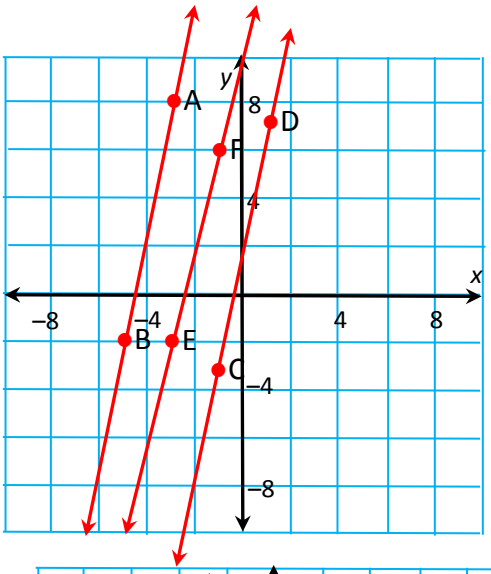
$$m = \frac{y_2 - y_1}{x_2 - x_1} \qquad m = \frac{y_2 - y_1}{x_2 - x_1} \qquad m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m_{AB} = \frac{-2-8}{-5-(-3)} \qquad m_{CD} = \frac{7-(-3)}{1-(-1)} \qquad m_{EF} = \frac{6-(-2)}{-1-(-3)}$$

$$m_{AB} = \frac{-10}{-2} \qquad m_{CD} = \frac{10}{2} \qquad m_{EF} = \frac{8}{2}$$

$$m_{AB} = 5 \qquad m_{CD} = 5 \qquad m_{EF} = 4$$

AB and CD are parallel to each other, but EF is not parallel to AB or CD.



Question 2

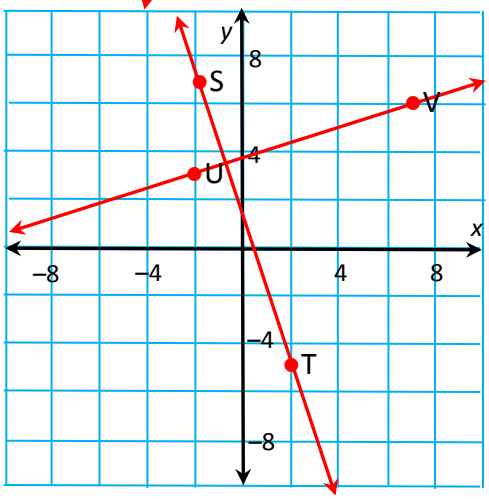
$$m = \frac{y_2 - y_1}{x_2 - x_1} \qquad m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m_{ST} = \frac{-5-7}{2-(-2)} \qquad m_{UV} = \frac{6-3}{7-(-2)}$$

$$m_{ST} = \frac{-12}{4} \qquad m_{UV} = \frac{3}{9}$$

$$m_{ST} = -3 \qquad m_{UV} = \frac{1}{3}$$

Since –3 is the negative reciprocal of $\frac{1}{3}$, ST is perpendicular to UV.



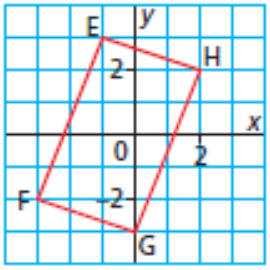
Question 3

$$m = \frac{y_2 - y_1}{x_2 - x_1} \qquad m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m_{EF} = \frac{-2-3}{-3-(-1)} \qquad m_{EH} = \frac{2-3}{2-(-1)}$$

$$m_{EF} = \frac{-5}{-2} \qquad m_{EH} = \frac{-1}{3}$$

$$m_{EF} = \frac{5}{2} \qquad m_{EH} = -\frac{1}{3}$$



Since $-\frac{1}{3}$ is not the negative reciprocal of $\frac{5}{2}$, EH is not perpendicular to EF. Therefore, EFGH is not a rectangle.

Assignment

1. Parallel lines have the same slope.

2. The slope of a perpendicular line is the negative reciprocal of the first line.

3. a) Parallel b) Neither c) Neither d) Perpendicular

4. a) i) $-\frac{4}{9}$ ii) $\frac{9}{4}$

   b) i) 5 ii) $-\frac{1}{5}$

   c) i) $\frac{7}{3}$ ii) $-\frac{3}{7}$

   d) i) –4 ii) $\frac{1}{4}$

5. Yes; the slope of the line through the golfer's club and the slope of the line through the golfer's feet are the same: approximately $-\frac{1}{6}$

6. a) i) A(–5, –2), B(1, 5) and C(–1, –4), D(4, 1)
      ii) Neither
   b) i) E(–3, 4), F(3, 2) and G(2, 5), H(0, –1)
      ii) Perpendicular
   c) i) J(–2, 3), K(1, –3) and M(3, 1), N(–4, –2)
      ii) Neither
   d) i) P(0, 5), Q(6, 2) and R(–4, –1), S(0, –3)
      ii) Parallel

7. a) Perpendicular b) Parallel c) Neither d) Neither

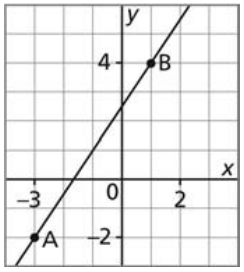
8. a) Slope of AB is $\frac{3}{2}$, or 1.5.

   b) Slope of CD is $\frac{3}{2}$, or 1.5.

   c) Answers may vary. For example: (1, 2), (3, 5)

   d) Slope of AE is $-\frac{2}{3}$

   e) Answers may vary. For example: (0, –4), (3, –6)



9. a)

$m_{HJ} = \frac{2}{7}$ $\quad$ $m_{MK} = \frac{2}{7}$

$m_{HM} = \frac{-6}{2} = -3$ $\quad$ $m_{JK} = \frac{-6}{2} = -3$

since HJ and MK are parallel, and HM and JK are parallel, HJKM is a parallelogram

b) To be a rectangle the sides have to form 90^o angles or, in other words, they are perpendicular. Since the slopes HJ and JK are not the negative inverses of each other, it is not a rectangle.

10. The slopes of BC and AC are negative reciprocals, so BC and AC are perpendicular: slope of BC: –2; slope of AC: $\frac{1}{2}$.

11. $c = -2$

12. a) $a = 3.25$
b) $a = 1.2$