Linear Graphing Practice
Math 130 Kovan

1. Let \( L \) be the straight line through the points \((2, 4)\) and \((8, 64)\). Find an equation and both intercepts and sketch the line. Label the two points given and the points found.

2. Let \( L \) be the straight line through the points \((6, -5)\) and \((27, 2)\). Find an equation and both intercepts and sketch the line. Label the two points given and the points found.

3. Let \( L \) be the straight line through the points \((\sqrt{2}, 2\sqrt{3})\) and \((\sqrt{3}, 3\sqrt{2})\). Find an equation and both intercepts and sketch the line. Label the two points given and the points found.

4. Let \( L \) be the straight line through the points \((8, 5)\) and \((20, 10)\).
   
   (a) Find an equation and both intercepts and sketch the line. Label the two points given and the points found.

   (b) Find an equation of the straight line passing through the point \((5, 3)\) and perpendicular to line \( L \).

   (c) Find the exact coordinates of the point on line \( L \) that is closest to the origin.

5. Let \( K \) be the line defined by the equation

\[
y = 0.225x + 1.8.
\]

   (a) Find and plot with exact coordinates: the \( x \) and \( y \)-intercepts, the point where \( x = 18 \) and the point where \( y = 18 \).

   (b) Find the exact coordinates of the midpoint of the portion of the graph that lies in the second coordinate and plot that midpoint. How far is it from the origin?

   (c) Find the distance from the origin of the point on the graph that is closest to the origin. Find the exact coordinates of that point.

Answers follow.
ANSWERS

1. The equation is $y = 10x - 16$. The intercepts are $(1.6, 0)$ and $(0, -16)$.

2. The equation is $y = (1/3)x - 7$. The intercepts are $(21, 0)$ and $(0, -7)$.

3. The equation is $y = \sqrt{6}x$. The intercept is $(0, 0)$.

4. (a) The equation is $y = (5/12)x + 5/3$. The intercepts are $(-4, 0)$ and $(0, 5/3)$.
    (b) The equation is $y = (-12/5)x + 15$.
    (c) The point on line $L$ closest to the origin is the point $(-100/169, 240/169)$.

5. (a) $x$-int: $(-8, 0)$; $y$-int: $(0, 1, 8); (18, 5.85); (72, 18)$.
    (b) $(-4, 0.9)$. It is 4.1 from the origin.
    (c) The distance from the origin is $\frac{72}{41} \approx 1.756098$.

The coordinates are \(-\frac{648}{1681}, \frac{2880}{1681}\) \approx (-.385485, 1.713266).