Test #3 Linear Relations Part 1

Knowledge & Understanding (KU)

1. Which of these relations are linear? How do you know? Show your work.

   a.) Given rise is -3 and the run is 4.

   b.) Given change in x is -3 and change in y is -15.

   c.) Given points (3, 3) and (-2, 2).

2. Calculate the slope of each line.

   a.) Given rise is -3 and the run is 4.

3. Graph $5x - 2y = 10$ using any method (E.g. slope/y-int form $y=mx+b$, xy intercepts or table of values). Show your work.
4. Find the equation for a line passing through (-1, 7) and (-2, 4).

5. Find the equation of a line parallel to \( y = 3x - 4 \), passing through the point (-1,0).

6. Identify each relation as a direct or a partial variation. Support your answer using a table of values.
   a.) \( y = 3x \)
   b.) \( y = -2x + 1 \)

   \[
   \begin{array}{c|c}
   x & y \\
   \hline
   0 & \_ \\
   1 & \_ \\
   2 & \_ \\
   3 & \_ \\
   4 & \_ \\
   \end{array}
   \]

7. Determine the rate of change or slope in each linear relation.
   a.)
   \[
   \begin{array}{c|c}
   x & y \\
   \hline
   2 & 11 \\
   4 & 17 \\
   6 & 23 \\
   8 & 29 \\
   10 & 35 \\
   \end{array}
   \]
   b.)
**Application (AP)**

1. An equation for a house’s value is $y = 5800x + 115000$, where $y$ is the value in dollars and $x$ is the time in years, starting now.
   a.) What is the current value of the house?
   b.) What is the value of the house 5 years from now?
   d.) At what rate is the house value changing from year to year?

2. Steven wants to rent a jet ski for a day. He gathers this information from two places.
   **Jared’s Jet Ski’s** charges a base fee of $30 and $15 per hour of use.
   **The Everything Ski Store** does not charge a base fee, but charges $45 per hour for a jet ski.
   a.) Write an equation to model the cost for each place. Let $C$ represent the cost in dollars and $h$ represent the time in hours.
   b.) Determine the cost of renting for 1 hour from each place.
   c.) Determine the cost of renting for 2 hours from each place.
   d.) Which place would you choose? Why?
   e.) Identify each plan as a direct or a partial variation.
1. Determine two more ordered pairs for each relation. Show your work.
   Rise is 4, run is -3; (-1, 0) lies on the line

2. This graph shows the maximum heart rate a person should try to achieve while exercising.
   a.) What does the y-intercept mean?
   b.) What does the slope represent?
   c.) Write an equation for the line.
   d.) Estimate the maximum heart rate for a 58-year-old.

3. Find the equation of a line perpendicular to y = 2, with the same x-intercept as y = -4x + 32