## Math 9 Linear Relations Lesson

- Two-variable linear relations using graphing, interpolation and extrapolation
- Two-variable continuous linear relations; includes rational coordinates
- Horizontal and vertical lines
- Graphing relation and analyzing
- Interpolating and extrapolating approximate values
- Spirit canoe journey predictions and daily checks
- 1. Plot the point (2, -4)
- 2. y = 3x + 2
  - a. Sketch this line
  - b. Slope?
  - c. *y*-intercept?
- 3. Sketch the line y = -2x + 1
- 4. y = 3
  - a. Sketch this line
  - b. What quadrants is this line in?
- 5. x = -1a. Sketch the line
  - b. What quadrants is this line in?
- 6. Plot the point  $\left(\frac{1}{2}, -3\right)$
- 7. Plot the point  $\left(-2.\overline{3}, 2\frac{4}{5}\right)$
- 8. Sketch x = 0

9. Sketch  $y = \pi$ 

- 10. y = 2x + 3
  - a. Create a table of values
  - b. Sketch the graph
  - c. State the x-intercept
  - d. When x = 4, what is the value of y?
- 11. Given y = mx + b what is the meaning of: a. m?
  - b. *b*?
- 12. Sketch y = 2 3x

13. Sketch  $y = \frac{-2}{3}x + 3$ 

- 14. Sketch  $y = 0.\overline{6} \frac{x}{3}$
- 15. Sketch  $x = \pi y$

16. Given the points (0, 2) and (8, 4)

- a. Find the slope
- b. Find the line equation in slope-point form:  $y y_1 = m(x x_1)$

- c. Find the line equation in slope-intercept form: y = mx + b
- 17. Given the points (3, -3) and (-1, -1)
  - a. Find the slope
  - **b.** Find the line equation in slope-point form:  $y y_1 = m(x x_1)$

c. Find the line equation in slope-intercept form: y = mx + b

18. Given the point  $\left(2\frac{1}{2}, -\frac{1}{2}\right)$  and  $\left(4, -2\frac{1}{4}\right)$  find the slope

## 19. You make \$50 for showing up to your job site and you charge \$40 per hour

a. What is the equation of the graph?

- b. Sketch this graph
- c. How much do you make for working 8 hours?
- d. How long do you have to work to earn \$290?

- 20. Your car burns 6L per 100 km and has a full tank of gas of 60L
  - a. Write the equation of the Volume distance graph
  - b. Sketch this graph
  - c. How much fuel do you have left in the tank after driving 300 km?
  - d. What is the meaning of the *x*-intercept?
  - e. What is the meaning of the slope of the graph?

- 21. A canoe starts at 2 km away from home. Each day the canoe travels 3 more km away from home.
  - a. Sketch a line graph that models the distance from home
  - b. Model this graph as a line equation
  - c. How far away is the canoe from home after a week?
  - d. Interpolate the distance from home after 2.5 days.
  - e. Extrapolate the distance from home after a month (30 days).
  - f. Why is interpolating data more accurate than extrapolating data?
- 22. See figures 1, 2, and 3 below respectively:



- a. How many circles are in figure 100?
- b. What figure number contains 131 circles?
- 23. 10, 7, 4, 1, -2, ... Find the 100<sup>th</sup> number