

Math 10 Linear Functions Practice (DO NOT WRITE ON THIS PAPER)

Linear functions are a cornerstone of the BC Math 10 curriculum. While you may already be familiar with foundational concepts like points, slopes, and intercepts from earlier math courses, this year you'll gain a comprehensive understanding of lines as a mathematical concept. Later in the course, you'll also explore the importance of two lines intersecting, deepening your grasp of this essential topic. Visit hunkim.com/10 for more BC Math 10 resources.

- Slope: positive, negative, zero, and undefined
- Types of equations and lines (point-slope, slope-intercept, and general)
- Equations of parallel and perpendicular lines
- Equations of horizontal and vertical lines
- Connections between representations: graphs, tables, equations

1. Slope = $\frac{\text{rise}}{?} = \frac{y_2 - y_1}{?}$

2. Points: $(2, 4)$ and $(5, 10)$. Slope?

3. $P(4, -2)$ and $Q(-1, 5)$. Slope?

4. Points: $(3, 4)$ and $(3, 6)$. Slope?

5. Points: $(1, -2)$ and $(2\frac{1}{2}, \frac{3}{4})$. Slope?

6. Points: $A(1, 2)$ and $B(4, a)$. Given the slope of line segment AB is 0, find a .

7. Sketch the line:

- $y = 2x - 3$
- $y = \frac{2}{-3}x + 1$
- $y = 1 - 3x$
- $y = -x$
- $y = \frac{x}{2} - 0.5$

8. $y = 3$

- Find the slope of this line
- Sketch
- What quadrants is this line in?

9. $x = 2$

- Slope?
- Sketch

10. $y = 3x - 2$

- Slope?
- y-intercept?
- (x, y) coordinates of the y-intercept?
- x-intercept?
- Sketch this line

11. $y = 3x - 2$

- Create a table of values for this function
- When $x = 100$, find y
- When $y = 10$, find x

12. $y = f(x) = 3x + 2$

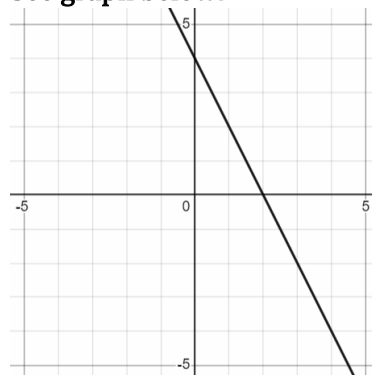
- Is the point $(7, 15)$ on this line?
- Is the point $(-5, -13)$ on this line?
- Evaluate $f(5)$

13. Given $h(t) = 2 - 4t$, evaluate $h(-2)$

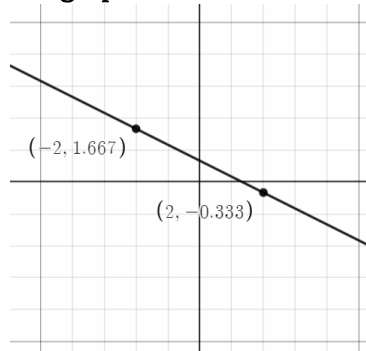
14. True or False: $y = -0.\overline{6}x + \frac{1}{5}0$ is the same line as $0 = 10x + 15y - 3$

15. What is the equation of the line below?

- See graph below:



b. See graph below:



16. A line contains the points (1, 2) and (5, 0)

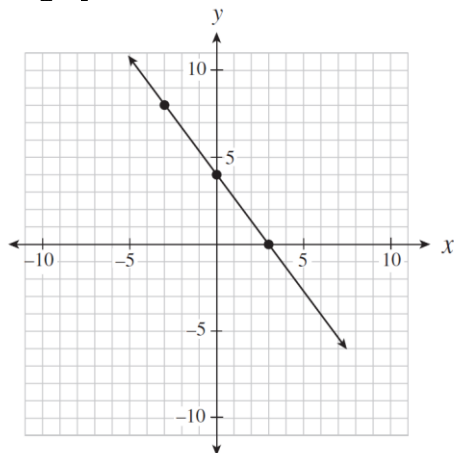
- Slope?
- Equation in the form $y - y_1 = m(x - x_1)$?
- Equation in the form $y = mx + b$?
- Intercepts?
- Equation in general form: $Ax + By + C = 0$, where the coefficients are integers and $A > 0$

17. What information is needed to determine the equation of a line?

18. $2x + \frac{1}{2} = \frac{y}{3}$

- Sketch
- Convert to Standard Form: $Ax + By = C$, where $A > 0$
- Find the intercepts

19. See graph below:



Which of the following equations describes the linear relation graphed above?

- $y = \frac{4}{3}x + 4$
- $y - 8 = -\frac{4}{3}(x + 3)$
- $4x + 3y - 12 = 0$

20. Consider the pattern 11, 7, 3, -1, ...

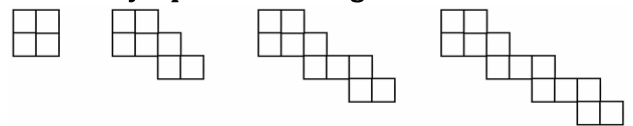
- Represent this pattern in the form $y = mx + b$
- Find the 1000th number

21. Consider the pattern 5, 8, 11, 14, ...

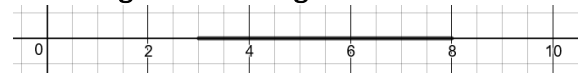
- The variable f represents the figure number. Figure 1 contains the number 5 and figure 2 contains the number 8 and so on. Find the equation $n = af + b$, where n represents the number at a particular figure number.
- Find the 100th number

22. See diagram below.

How many squares are in figure 43?



23. How long is the line segment below?



24. Do the following table of values represent points on a line?

- See table below:

x	y
0	2
1	5
2	8
4	11

- See table below:

x	y
-2	-4
-1	-1
0	2
2.5	19/2

25. The following table of values represents a line. Find the missing value below:

x	y
-2	3
2	15
5	?

26. Money is a function of time in hours:

$$M(t) = 20t + 50$$

- How much do you get paid for working 0 hours?
- How much do you get paid if you work for 8 hours?
- How many hours do you have to work to earn \$280? Assume there is no overtime pay.
- In the context of this question, what is the domain?

27. $y = 4x - 3$

- What is the slope of the line that is parallel to this line?
- What is the slope of the line that is perpendicular to this line?

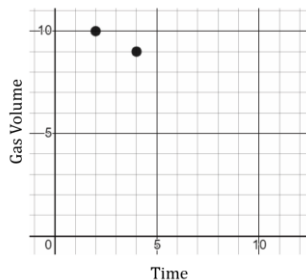
28. Find the equation of a line that is parallel to $y = 3x - 2$ and:

- goes through the point $(3, 2)$
- has a y-intercept of 4
- has an x-intercept of 6

29. Find the equation of a line that is perpendicular to $y = 2x + 1$ and:

- goes through the point $(4, 1)$
 - goes through the origin
- Point $(0, 0)$

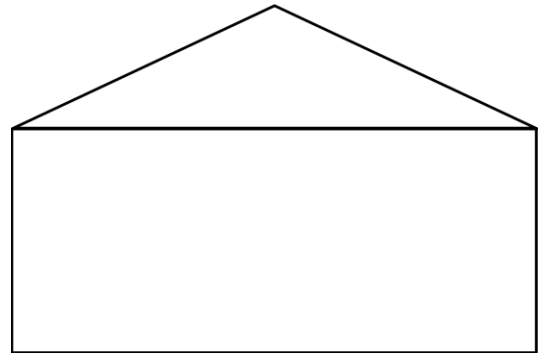
30. Draw a line through the two points in the gas – time graph below:



- When do you run out of gas
- Initial amount of gas?

31. You are paid \$100 for every day of work, plus \$20 per sale for your sales job. Make a graph of your income to sales (with income as your dependent variable).

32. Use a ruler to estimate the positive slope of the house roof below:

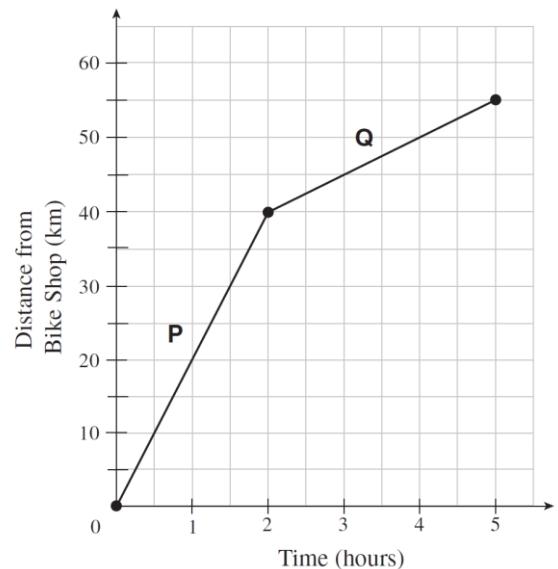


33. A hot-dog stand owner makes a profit of \$100 when he sells 90 hot dogs a day. He has a loss of \$30 when he sells 25 hot dogs a day. Model his profit with a line equation.

34. $A\left(\frac{2}{3}, -1\right)$ and $B(k, 3k)$.

Given the slope is 2, find k .

35. The graph below models a bicycle's distance from a bike shop over time. Calculate the change in the speed of the bike from segment P to segment Q .



36. Given the equation $Ax + By + C = 0$, which of the following conditions must be true for the graph of the line to have a positive slope and a positive y-intercept?

- $A > 0, B > 0, C > 0$
- $A > 0, B < 0, C > 0$
- $A > 0, B > 0, C < 0$
- $A > 0, B < 0, C < 0$

37. Two isosceles triangles have the same height. The slopes of the sides of triangle A are double the slopes of the corresponding sides of triangle B. How do the lengths of their bases compare?