



Vocabulary



continuous
discrete

equivalent
non-linear functions

parent graph
slope-intercept form



- Graph linear equations in slope-intercept form.
- Write a linear equation for a given graph.
- Write a linear equation in slope-intercept form when given information about the line.
- Convert different forms of linear equations to slope-intercept form.
- Graph linear equations that are not written in slope-intercept form.
- Graph a linear inequality on a coordinate plane.
- Recognize linear, quadratic, exponential and inverse variation functions.

Lesson 3.1 ~ Graphing Using Slope-Intercept Form

Draw a coordinate plane for each problem and graph the given equation. Clearly mark three points on the line.

1. $y = 3x - 4$

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

3. $y = x - 1$

4. $y = -2x$

5. $x = 3$

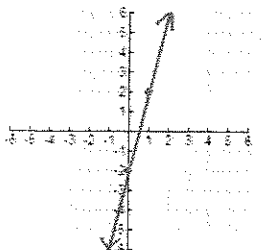
6. $y = 6 + \frac{4}{3}x$

7. Create a linear equation that satisfies each condition. Graph your equations on a coordinate plane.
- Slope = 2 and a negative y -intercept
 - Slope = 0 and a y -intercept of -3
 - A negative slope and a positive y -intercept
 - A positive slope and a y -intercept of 0

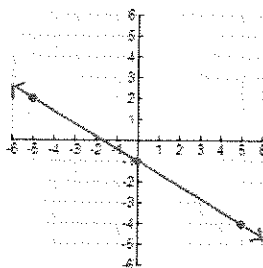
Lesson 3.2 ~ Writing Linear Equations for Graphs

Identify the slope and y -intercept of each graph and write the corresponding linear equation in slope-intercept form.

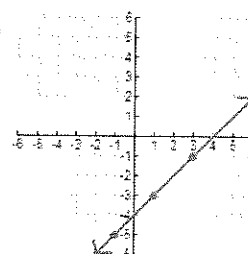
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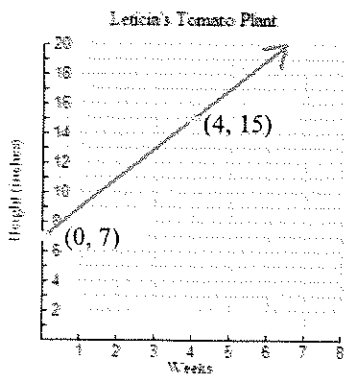


9.



10.





- 11.** At two different times during the summer, Leticia measured the height of a tomato plant she had planted in June. She measured it when she first planted it and then again 4 weeks later.
- Find the slope-intercept equation that represents the height of Leticia's tomato plant based on the number of weeks since she planted it.
 - Use your equation to determine exactly how tall the tomato plant will be after 7 weeks.
 - Determine how many weeks have passed if the plant is 29 inches tall. Use mathematics to justify your answer.



Lesson 3.3 ~ Writing Linear Equations from Key Information

Write an equation in slope-intercept form when given key information about a line.

- | | |
|------------------------------------------------------------|-----------------------------------------------------------------------|
| 12. slope = $\frac{3}{4}$, y -intercept = 5 | 13. slope = -5 , y -intercept = 1 |
| 14. slope = 1, y -intercept = 9 | 15. slope = $\frac{2}{5}$, y -intercept = 0 |
| 16. slope = 2, goes through the point (2, 3) | 17. slope = $\frac{1}{2}$, goes through the point (6, 1) |
| 18. slope = -1 , goes through the point $(-3, 5)$ | 19. slope = $\frac{5}{2}$, goes through the point $(-6, -10)$ |
| 20. goes through the points (1, 1) and (5, 9) | 21. goes through the points $(-6, 0)$ and (3, 3) |
| 22. goes through the points $(-4, 8)$ and $(-3, 5)$ | 23. goes through the points (8, -4) and (5, -4) |



- 24.** A furniture rental company rents large screen televisions. They charge an initial fee plus \$20 for each day the TV is rented. Steven rented a TV for 8 days and was charged \$225. Let x represent the number of days and y represent the total cost of the rental.
- Identify the slope and one ordered pair from the information given.
 - Find the equation of the line that fits this information.
 - If another customer rents a TV for 17 days, how much should he expect to pay?
- 25.** A canoe rental company on Deep Sea Lake rents canoes for a set fee plus an additional charge per hour. Marshall asked two different individuals how many hours they had rented their canoes for and how much it cost. One rented a canoe for 4 hours and paid \$32. Another person rented a canoe for 10 hours for \$56. Let x represent the length of time in hours and let y represent the total cost.
- What is the linear equation that represents the data?
 - What number in the linear equation represents the amount of the set fee?
 - What is the real-world meaning of the slope in this equation?
 - How much will someone pay for a canoe rental from this company if he keeps the canoe for 6 hours? Show all work necessary to justify your answer.

Lesson 3.4 ~ Different Forms of Linear Equations



Convert each equation to slope-intercept form.

26. $y = 4 + 2(x - 7)$

27. $3x + 6y = 18$

28. $y = \frac{1}{4}(x + 4) - 3$

29. $4x - 5y = 15$

30. $-x + 3y = -12$

31. $y - 2 = 3(x + 1)$

Lesson 3.5 ~ More Graphing Linear Equations



Convert each equation to slope-intercept form and graph. Clearly mark at least three points on each line.

32. $-4x + 2y = -6$

33. $y + 1 = 3(x - 2)$

34. $y = \frac{3}{2}(x - 4) + 2$

35. $7x = -14$

36. $x + 3y = 12$

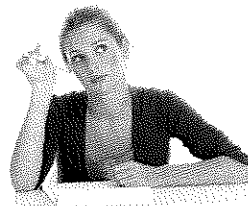
37. $y = 2(x - 1) + 2$

Determine if each point is on the given line. Show all work necessary to justify your answer.

38. Is the point $(-2, 1)$ on the line $4x - 3y = -11$?

39. Is the point $(2, 5)$ on the line $y = 2(x - 1) + 3$?

40. Is the point $(-6, 0)$ on the line $y + 4 = \frac{1}{2}(x + 4) + 3$?



Lesson 3.6 ~ Graphing Linear Inequalities in Two Variables



Graph each linear inequality.

41. $y < 2x - 4$

42. $y \geq \frac{3}{4}x - 2$

43. $y < -x + 1$

44. $y > -\frac{1}{2}x$

45. $y \geq -4$

46. $2x + 3y < 9$

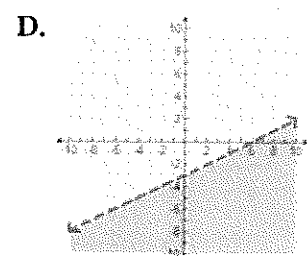
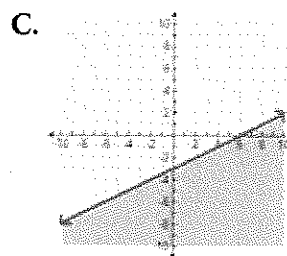
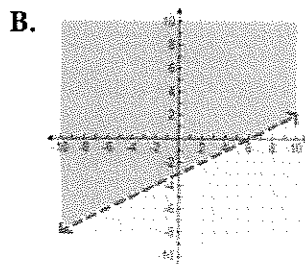
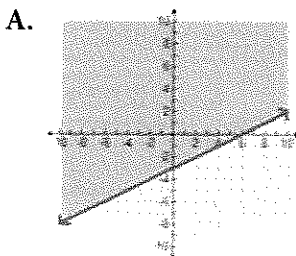
Match each linear inequality with its graph.

47. $y \geq \frac{1}{2}x - 3$

48. $y \leq \frac{1}{2}x - 3$

49. $y < \frac{1}{2}x - 3$

50. $y > \frac{1}{2}x - 3$

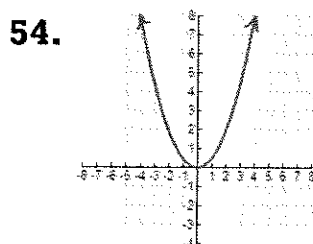
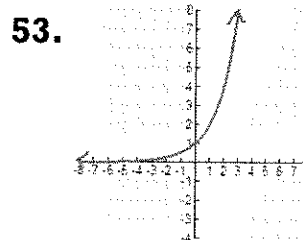


Determine if each graph, table or equation is linear or non-linear. If it is non-linear, identify the type of graph (quadratic, exponential or inverse variation).

51.

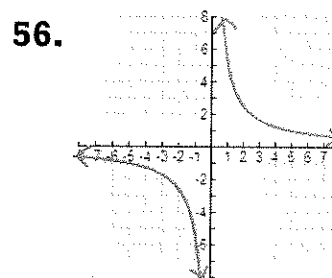
x	y
-2	12
-1	3
0	0
1	3
2	12

52. $y = \frac{2}{3}x - 4$



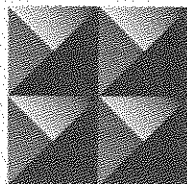
55.

x	y
-2	0
-1	2
0	4
1	6
2	8



57. Nicki deposits \$4,000 in a savings account. Each year the bank gives her 3% interest based on the current value of the account.
- Create a table of values showing the value of her bank account after Years 1, 2 and 3.
 - Is this relationship linear or non-linear? Explain your reasoning.

TIC-TAC-TOE ~ GRAPHING DESIGN



Lines are used in many types of artwork. Use a large sheet of graph paper to create a piece of artwork.



Step 1: Draw a coordinate plane that includes all four quadrants.

Step 2: Create a design using at least 15 different lines. Make sure over two-thirds of the lines are not vertical or horizontal.

Step 3: Write the equations for each line on the back of your piece of artwork.

Step 4: Color your artwork and sign the bottom right corner.