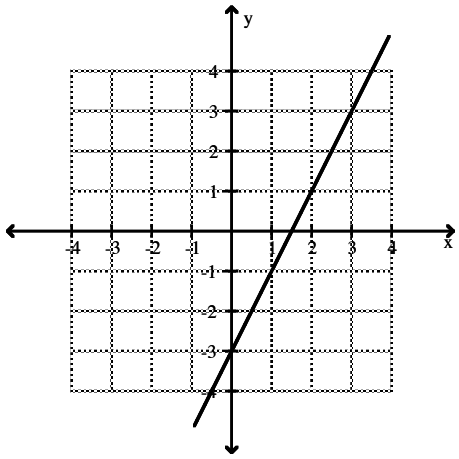
MATH 1710 Unit 2 Review

Linear Functions and Models; 2.1
Equations of Lines; 2.2
Linear Equations; 2.3
Linear Inequalities; 2.4
Piece–wise Defined Linear Functions; 2.1
Linear Approximation; 2.1
Absolute Value Equations and Inequalities; 2.5

Identify the slope, y–intercept, and x–intercept.

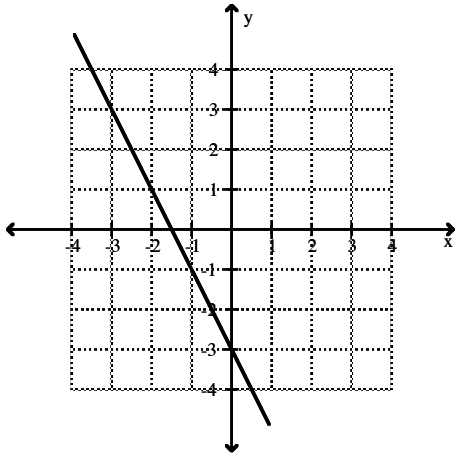
1.



A) Slope: 2; y–intercept: $\frac{3}{2}$; x–intercept: –3

B) Slope: 2; y–intercept: –3; x–intercept: $\frac{3}{2}$

2.

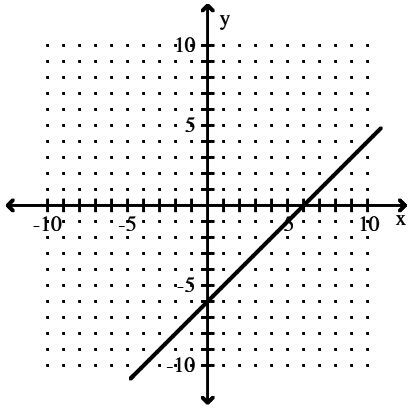


A) Slope: 3; y–intercept: 3; x–intercept: $\frac{3}{2}$

B) Slope: –2; y–intercept: –3; x–intercept: $-\frac{3}{2}$

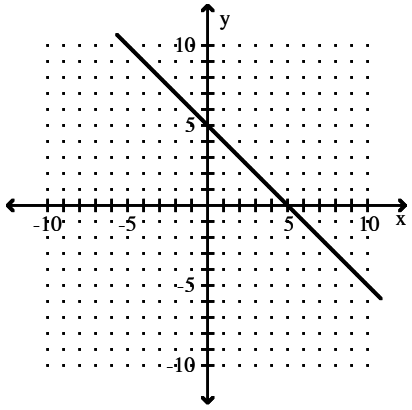
Write the equation of the line whose graph is shown.

3.



A) $y = -x - 6$ B) $y = x + 6$ C) $y = -x + 6$ D) $y = x - 6$

4.



A) $y = -x + 5$ B) $y = x - 5$ C) $y = -x - 5$ D) $y = x + 5$

Write a formula for a linear function f whose graph satisfies the conditions.

5. Slope: $\frac{9}{2}$; y–intercept: –13

A) $f(x) = -\frac{9}{2}x - 13$ B) $f(x) = -\frac{9}{2}x + 13$ C) $f(x) = \frac{9}{2}x - 13$ D) $f(x) = \frac{9}{2}x + 13$

6. Slope: $\frac{1}{3}$; y–intercept: 4

A) $f(x) = -\frac{1}{3}x + 4$ B) $f(x) = \frac{1}{3}x + 4$ C) $f(x) = \frac{1}{3}x - 4$ D) $f(x) = -\frac{1}{3}x - 4$

Solve the problem using your calculator.

7. The paired data below consist of the costs of advertising (in thousands of dollars) and the number of products sold (in thousands). Use linear regression to find a linear function that predicts the number of products sold as a function of the cost of advertising.

Cost	9	2	3	4	2	5	9	10
Number	85	52	55	68	67	86	83	73

A) $y = -26.4 - 1.42x$
B) $y = 55.8 + 2.79x$
C) $y = 55.8 - 2.79x$
D) $y = 26.4 + 1.42x$

8. A study was conducted to compare the average time spent on the MML each week versus course grade for MATH 1710 students. The results are recorded in the table below. Use linear regression to find a linear function that predicts a student's course grade as a function of the number of hours spent in lab.

Number of hours spent on MML	Grade (percent)
10	96
11	51
16	62
9	58
7	89
15	81
16	46
10	51

A) $y = 88.6 - 1.86x$
B) $y = 0.930 + 44.3x$
C) $y = 1.86 + 88.6x$
D) $y = 44.3 + 0.930x$

Write an equation of the line through the given point with the given slope. Write the equation in slope–intercept form.

9. (5, 2); slope: $-\frac{2}{3}$

A) $y = -\frac{2}{3}x - \frac{16}{3}$
B) $y = -\frac{2}{3}x + \frac{3}{16}$
C) $y = -\frac{3}{2}x + \frac{16}{3}$
D) $y = -\frac{2}{3}x + \frac{16}{3}$

10. (–8, –3); slope: 0

A) $y = -\frac{3}{8}x + 0$
B) $x = -8$
C) $y = -3$
D) $y = -\frac{8}{3}x + 0$

11. (8, –3); slope: –7

A) $y = 7x + 52$
B) $y = -7x + 54$
C) $y = -7x + 53$
D) $y = -7x + 51$

Write the slope–intercept form of the equation for the line passing through the given pair of points.

12. (9, –2) and (–6, –4)

A) $y = \frac{11}{2}x - 37$ B) $y = -\frac{11}{2}x - 37$ C) $y = -\frac{2}{15}x - \frac{16}{5}$ D) $y = \frac{2}{15}x - \frac{16}{5}$

13. (–2, –1) and (–2, –5)

A) $x = -2$ B) $-5x - 1y = 0$ C) $y = -1$ D) $-1x - 5y = 0$

14. (10, 3) and (–9, 3)

A) $x = 10$ B) $y = 3$ C) $-9x + 10y = 0$ D) $10x - 9y = 0$

Determine the equation of the line described. Put the answer in the slope–intercept form, if possible.

15. Through (1, 5), perpendicular to $-9x - 4y = -29$

A) $y = -\frac{4}{9}x - \frac{41}{9}$ B) $y = \frac{9}{4}x + 41$ C) $y = \frac{4}{9}x$ D) $y = \frac{4}{9}x + \frac{41}{9}$

16. Through (–2, 2), parallel to $4x - 7y = 6$

A) $y = \frac{4}{7}x + \frac{22}{7}$ B) $y = -\frac{4}{7}x - \frac{22}{7}$ C) $y = -\frac{2}{7}x - \frac{6}{7}$ D) $y = \frac{7}{4}x + \frac{1}{2}$

17. Through (–3, –4), perpendicular to $3x + 5y = -29$

A) $y = \frac{5}{3}x + 1$ B) $y = \frac{3}{5}x - 3$ C) $y = -\frac{5}{3}x - 1$ D) $y = \frac{5}{3}x$

Find an equation of the line satisfying the following conditions. If possible, write the equation in slope–intercept form.

18. Vertical, passing through (–1, –3)

A) $x = -1$ B) $y = -3$ C) $x = -3$ D) $y = -1$

19. Horizontal, passing through (–3, 9)

A) $y = 9$ B) $x = -9$ C) $x = -3$ D) $y = 3$

Solve the equation symbolically.

20. $29t - 3 = 8t + 12$

A) $-\frac{5}{7}$ B) $\frac{37}{9}$ C) $\frac{5}{7}$ D) $\frac{37}{4}$

21. $\frac{9x + 1}{2} + \frac{3x - 2}{3} = \frac{9}{4}$

A) $\frac{25}{66}$ B) $\frac{29}{66}$ C) $\frac{13}{132}$ D) $\frac{13}{66}$

Solve the problem. Round your answer to the nearest whole number.

22. A tree casts a shadow 15 m long. At the same time, the shadow cast by a 48–cm tall statue is 92 cm long. Find the height of the tree.

A) 29 m B) 6 m C) 8 m D) 27 m

23. A line from the top of a cliff to the ground passes just over the top of a pole 8.0 feet high and meets the ground at a point 5.0 feet from the base of the pole. If the point is 86 feet from the base of the cliff, how high is the cliff?

A) 3440 feet B) 688 feet C) 138 feet D) 8 feet

Solve the problem.

24. How many liters of a 10% alcohol solution must be mixed with 90 liters of a 50% solution to get a 20% solution?

A) 36 liters B) 360 liters C) 270 liters D) 27 liters

25. In a chemistry class, 5 liters of a 4% silver iodide solution must be mixed with a 10% solution to get a 6% solution. How many liters of the 10% solution are needed?

A) 1.5 liters B) 3.5 liters C) 2.5 liters D) 5 liters

26. A square plywood platform has a perimeter which is 7 times the length of a side, decreased by 12. Find the length of a side.

A) 7 B) 4 C) 1 D) 3

27. A rectangular Persian carpet has a perimeter of 172 inches. The length of the carpet is 26 in. more than the width. What are the dimensions of the carpet?

A) Width: 60 in.; length: 86 in.
B) Width: 56 in.; length: 82 in.
C) Width: 30 in.; length: 56 in.
D) Width: 73 in.; length: 99 in.

Write the following in interval notation.

28. $\{x \mid x > 4\}$

A) $(-\infty, 4)$
B) $(4, -\infty)$
C) $(\infty, 4)$
D) $(4, \infty)$

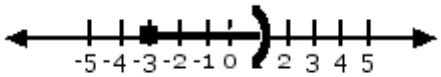
29. $\{x \mid x \le -3\}$

A) $[-3, \infty)$
B) $(\infty, -3]$
C) $(-\infty, -3]$
D) $[-3, -\infty)$

30. $\{x \mid -5 \le x < 9\}$

A) $(-5, 9]$
B) $(-5, 9)$
C) $[-5, 9]$
D) $[-5, 9)$

Express the following in Interval Notation



Solve the inequality symbolically. Express the solution set in interval notation.

31. $21y - 21 > 3(6y - 6)$

A) $(1, \infty)$
B) $(-\infty, 1)$
C) $(21, \infty)$
D) $(-\infty, 21)$

32. $-3 < 10x - 7 \le 8$

A) $(\frac{3}{2}, \frac{2}{5}]$
B) $[\frac{2}{5}, \frac{3}{2})$
C) $(\frac{2}{5}, \frac{3}{2}]$
D) $[\frac{3}{2}, \frac{2}{5})$

33. $-3 \le -1 - 4x \le 13$

A) $[\frac{1}{2}, -\frac{7}{2}]$
B) $(\frac{1}{2}, -\frac{7}{2})$
C) $(-\frac{7}{2}, \frac{1}{2})$
D) $[-\frac{7}{2}, \frac{1}{2}]$

Solve the equation.

34. $|r - 5| = 7$

A) No solution B) -12 C) $2, 12$ D) $-2, 12$

35. $|b + 6| - 8 = 0$

A) $2, -14$ B) $-2, 14$ C) 2 D) No solution

36. $|x| = -1$

A) No Solution B) -1 C) $-1, 1$ D) 1

Solve the absolute value inequality. Write the solution set using interval notation.

37. $|x| > 5$

A) $(-5, 5)$ B) $(5, \infty)$ C) $(-5, \infty)$ D) $(-\infty, -5) \cup (5, \infty)$

38. $|x| \leq 13$

A) $(-\infty, -13]$ B) $(-\infty, 13]$

C) $[-13, 13]$ D) $(-\infty, -13] \cup [13, \infty)$

1. B
   ID: CA4R 2.1.3–1+
2. B
   ID: CA4R 2.1.3–2+
3. D
   ID: CA4R 2.1.4–4
4. A
   ID: CA4R 2.1.4–5
5. C
   ID: CA4R 2.1.8–3
6. B
   ID: CA4R 2.1.8–4
7. B
   ID: CA4R 2.1.18–3
8. A
   ID: CA4R 2.1.18–5+
9. D
   ID: CA4R 2.2.5–2
10. C
    ID: CA4R 2.2.5–4
11. C
    ID: CA4R 2.2.5–6
12. D
    ID: CA4R 2.2.4–3
13. A
    ID: CA4R 2.2.4–5
14. B
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34. D
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35. A
    ID: CA4R 2.5.1–4
36. A
    ID: CA4R 2.5.1–7
37. D
    ID: CA4R 2.5.2–1
38. C
    ID: CA4R 2.5.2–2