

## Linear Equations - ANSWERS

### L.1 Exercises

- |                |                             |                                 |                         |
|----------------|-----------------------------|---------------------------------|-------------------------|
| 1. linear      | 3. equivalent               | 5. empty set                    | 7. Equations, evaluated |
| 9. false       | 11. false                   | 13. false                       | 15. equation            |
| 17. expression | 19. not linear              | 21. linear                      | 23. not linear          |
| 25. yes        | 27. no                      | 29. $\frac{5}{6}$               | 31. $-2$                |
| 33. $-1$       | 35. $\mathbb{R}$ ; identity | 37. $\emptyset$ ; contradiction | 39. $-\frac{2}{3}$      |
| 41. $-6$       | 43. $\frac{13}{66}$         | 45. $-1$                        | 47. $-12$               |
| 49. 3          | 51. $\frac{5}{32}$          | 53. $\frac{145}{23}$            | 55. 2500                |





### L.2 Exercises

- |  |                            |
|--|----------------------------|
| 1. A and C                                       | 3. $r = \frac{l}{pt}$      |
| 5. $m = \frac{E}{c^2}$                           | 7. $b = 2A - a$            |
| 9. $l = \frac{P-2w}{2}$ or $l = \frac{P}{2} - w$ | 11. $\pi = \frac{s}{rs+1}$ |
| 13. $C = \frac{5}{9}(F - 32)$                    | 15. $p = 2Q + q$           |
| 17. $q = \frac{T-B}{Bt}$                         | 19. $R = \frac{d}{1-st}$   |
| 21. a. $C(n) = 1.9n + 3.2$                       | 23. a. 50 mg               |
| b. \$22.20                                       | b. $d = \frac{ac+12c}{a}$  |
| c. 14 km   | c. 75 mg                   |
| 25. a. $C = 530x$                                | 27. $W = \frac{A}{L}$      |
| b. 15900   |                            |
| 29. a. $t = \frac{l}{Pr}$                        |                            |
| b. 2 year  |                            |

### L.3 Exercises

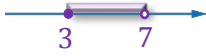
1.  $x - 7$
5.  $x^2 - y^2$
9.  $\frac{3x}{10}$
13.  $x^2 - x$
17. 348 and 349
21. 9, 11, 13
25. \$38600
29. \$18,000 at 4%  
\$22,000 at 6%
33. \$8500
37. 5 ft by 15 ft
41. 8 kg of 28.50 \$/kg  
17 kg of 22.25 \$/kg
45. 6.85 \$/oz
49. 33 %
53. 480 mph; 600 mph
57. 44 mi
3.  $\frac{1}{2}(x + y)$
7.  $n + (n + 1) + (n + 2) = 30$
11.  $0.03x - 100$
15.  $-\frac{48}{7}$
19. 11%
23. 23, 25, 27
27.  $\sim 196700$
31. \$8,000 at 3.5%  
\$29,000 at 4%
35.  $38^\circ, 66^\circ, 76^\circ$
39. 5 nickels; 3 dimes
43. 320 adult tickets
47. 120 ml
51. 3 liters
55. 40 min

### L.4 Exercises

1. true
9.  $[-1, 5)$
13.  $x \leq 2$   

17.  $(6, \infty)$   

3. reversed
5. bounded
11.  $[-2, \infty)$
15.  $-1 \leq x < 4$   

19.  $(-\infty, 0]$   

7. closed

A6

21.  $[3, 7)$



25. no

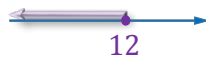
29.  $(\frac{9}{7}, \infty)$



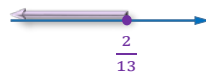
33.  $(-\infty, -12)$



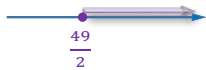
37.  $(-\infty, 12]$



41.  $(-\infty, \frac{2}{13}]$



45.  $[\frac{49}{2}, \infty)$



49.  $(-\frac{1}{3}, \frac{1}{9})$



53.  $[\frac{9}{2}, 12)$



57.  $5 - 3x \leq 7$   
 $x \in [-\frac{2}{3}, \infty)$

61.  $1 < \frac{x}{2} - 3 < 12$   
 $x \in (8, 30)$

65. \$29.50

69. up to 20 cheques

23.  $[0, 1]$



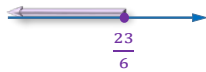
27. yes

31.  $[-18, \infty)$

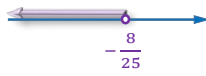


35.  $\emptyset$  (no solution)

39.  $(-\infty, \frac{23}{6}]$



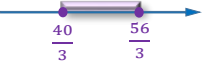
43.  $(-\infty, -\frac{8}{25})$



47.  $(-\frac{5}{3}, \frac{4}{3})$



51.  $[\frac{40}{3}, \frac{56}{3}]$








55.  $5x - 6 < -16$   
 $x \in (-\infty, -2)$

59.  $2(x + 1) \neq 14$   
 $x \in (-\infty, 6) \cup (6, \infty)$

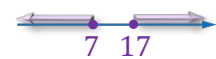
63. from 53 to 98

67. between 32°F and 86°F

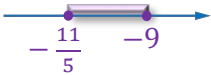
1. intersection      3. compound      5. bounded      7.  $\{1, 2, 3, 4, 5\}$   
 9.  $\{2, 4\}$       11.  $\{1, 2, 3, 4, 5\}$       13.  $\{1, 2, 3, 4, 5\}$       15.  $(-1, 5]$   
 17.  $(-7, 10]$       19.  $\emptyset$       21.  $(-\infty, \infty)$       23.  $[3, \infty)$   
 25.  $[-6, 2]$   
  
 29.  $(-\infty, -2)$   
  
 33.  $[-\frac{11}{3}, -3]$   
  
 37.  $[-12, \infty)$   
  
 41.  $[\frac{9}{2}, 6]$   
  
 45. at  $-37.9^\circ\text{F}$  or below and at  $674.1^\circ\text{F}$  or above      47. between 7.5 and 20

## L.6 Exercises

1. absolute value      3. multiplication; division; addition; subtraction  
 5. solution set; two      7.  $2x^2$       9.  $\frac{5}{|y|}$       11.  $7x^4|y|^3$   
 13.  $\frac{x^2}{|y|}$       15.  $\frac{x^2}{2}$       17.  $(x-1)^2$       19. a.  $\emptyset$     b. 1    c. 2  
 21.  $\{-4, 4\}$       23.  $\{-5, 11\}$       25.  $\{0, \frac{10}{3}\}$       27.  $\{-28, 16\}$   
 29. no solution      31.  $\{-2, 2\}$       33.  $\{-7, 8\}$       35.  $\{-\frac{3}{5}, 5\}$   
 37.  $\{-\frac{40}{3}, -\frac{20}{7}\}$       39.  $\{\frac{20}{17}, \frac{40}{13}\}$       41.  $(-7, -1)$       43.  $(-\infty, 7] \cup [17, \infty)$



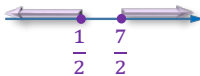
45.  $[-\frac{11}{5}, 1]$



49.  $[-72, 120]$



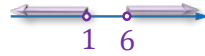
53.  $(-\infty, \frac{1}{2}] \cup [\frac{7}{2}, \infty)$



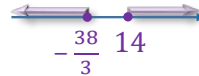
57.  $\{-6\}$

59.  $\emptyset$

47.  $(-\infty, 1) \cup (6, \infty)$



51.  $(-\infty, -\frac{38}{3}] \cup [14, \infty)$



55.  $[-5, -3]$



61.  $\mathbb{R}$

63. If  $A$  is the solution set of  $|x - a| < b$ , then  $\mathbb{R} \setminus A$  is the solution set of  $|x - a| \geq b$ .

65. 59 km/h; 63 km/h

67. a.  $|I - 39000| > 5000$ b.  $I \in (-\infty, 34000) \cup (44000, \infty)$ 69.  $|T - 37| \leq 0.6$