11. a) $t = -14.56$ **b)** $x = 9.5$ **c)** $r = \dfrac{4}{3}$ **d)** $v = -\dfrac{20}{7}$

12. $34.95

13. 58.6 Earth days

14. a) $e = -6.7$ **b)** $r = 1.5$ **c)** $h = -21.1$ **d)** $q = \dfrac{7}{8}$

15. $m = -1.97$

16. $k = 3.225$ m

17. $21.75

18. a) $n = 15$ **b)** $f = 1.75$ **c)** $g = -1.6$ **d)** $h = -60$

e) $v = -\dfrac{11}{6}$

19. a) $a = 1.9$ **b)** $P = 25.2$ units

20. $w = 7.5$ cm

Chapter 9

9.1 Representing Inequalities, pages 347–349

**5. a)** Example: $x \geq 3$ **b)** Example: $x < 7$
**c)** Example: $x \leq -13$ **d)** Example: $x > -1.5$
6. a) Yes; 4 is greater than 3.

0 3 6
4

b) No; 4 is not less than 4.

0 3 6
4
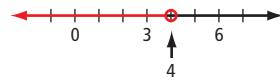
c) Yes; 4 is greater than -9.

-10 -4 2
4
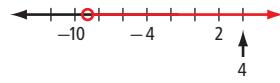
d) Yes; 4 is greater than or equal to 4.

0 3 6
4
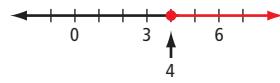
7. a) Example: All values greater than or equal to 8. Three possible values are 11, 15, and 22.
b) Example: All values less than -12. Three possible values are -14, -21.5, and -100.
c) Example: All values less than or equal to 6.4. Three possible values are 1, 3, and 6.4.
d) Example: All values that exceed -12.7. Three possible values are -11, 0, and 33.
8. a)

12 32 52
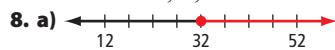
b) $p \geq 32$
9. a) All values greater than 4. **b)** All values less than or equal to -2. **c)** All values greater than or equal to -13.
10. a) Example: $x < 12.7$ or $12.7 > x$
b) Example: $y > 4.65$ or $4.65 < y$
c) Example: $y \leq -24.3$ or $-24.3 \geq y$
11. a)

0 3 6

b)

9 12 15

c)

-23 -19 -15

d)

-6 -4 -2 0

12. a)

10.4 10.7 11.0

b)

-5 -6

c)

-1 0

d)

4 5

13. a)

12 17

b)

-5 0

c)

1 2 3 4

d)

-12 -10 -8 -6 -4 -2 0

14. a)

-10 -9 -8 -7 -6

b) Example: The values of -10.0 and -9.8 are both less than -9.3, so they are not possible values. Conversely, -9.0 is larger than -9.3 so it is a possible value.

-10 -9 -8 -7 -6

15. a) The value is greater than or equal to 20, and less than or equal to 27; $20 \leq x$ and $x \leq 27$ **b)** The value is less than 2, and greater than -6; $-6 < x$ and $x < 2$ **c)** The value is less than -8, and greater than or equal to -9.2; $-9.2 \leq x$ and $x < -8$
16. a) $m \geq 18\ 000$ **b)** $t \leq 8$ **c)** $d > 700$
17. a)

1000 1500 2000
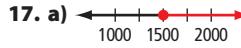
b) $x \geq 1500$
18. a) Paul will beat the record if he finishes the race in less than 41.5 s. **b)** $t < 41.5$
19. a) Example: A school environmental awareness club hopes to recycle at least 650 cans each month.
b)

600 650 700

c) $c \geq 650$
20. a) $m \leq 10.75$ **b)**
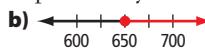
10.00 11.00
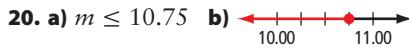
21. a) Shanelle will have to pay more insurance if the distance between her home and workplace is farther than 15 km. **b)**

13 15 17

22. a)

3 4 5   20 30 40   30 50 70

b) $w \leq 4$; $s \leq 30$; $m \geq 50$
23. a) $x = 6$ **b)** Since the only possible value for x that satisfies both inequalities is 6, there will be a single solid dot on the number line at 6.
24. $50 < s \leq 80$
25. a) All values greater than 4 and less than 7

4 7

b) All values less than 4

4 7
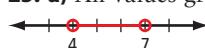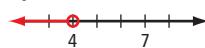
c) All values greater than 7

4 7

d) All values less than 4 and greater than 7

4 7