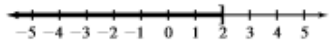
Chapter P
Prerequisites

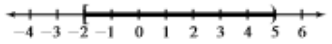
Section P.1 Real Numbers

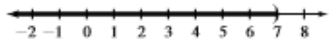
Quick Review P.1

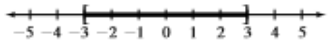
1. $\{1, 2, 3, 4, 5, 6\}$
2. $\{-2, -1, 0, 1, 2, 3, 4, 5, 6\}$
3. $\{-3, -2, -1\}$
4. $\{1, 2, 3, 4\}$
5. **(a)** 1187.75 **(b)** -4.72
6. **(a)** 20.65 **(b)** 0.10
7. $(-2)^3 - 2(-2) + 1 = -3$; $(1.5)^3 - 2(1.5) + 1 = 1.375$
8. $(-3)^2 + (-3)(2) + 2^2 = 7$
9. 0, 1, 2, 3, 4, 5, 6
10. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

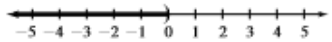
Section P.1 Exercises

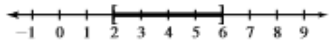
1. -4.625 (terminating)
2. $0.\overline{15}$ (repeating)
3. $-2.1\overline{6}$ (repeating)
4. $0.\overline{135}$ (repeating)
5. 

all real numbers less than or equal to 2 (to the left of and including 2)
6. 

all real numbers between -2 and 5, including -2 and excluding 5
7. 

all real numbers less than 7 (to the left of 7)
8. 

all real numbers between -3 and 3, including both -3 and 3
9. 

all real numbers less than 0 (to the left of 0)
10. 

all real numbers between 2 and 6, including both 2 and 6
11. $-1 \le x < 1$; all numbers between -1 and 1 including -1 and excluding 1
12. $-\infty < x \le 4$, or $x \le 4$; all numbers less than or equal to 4
13. $-\infty < x < 5$, or $x < 5$; all numbers less then 5
14. $-2 \le x < 2$; all numbers between -2 and 2, including -2 and excluding 2
15. $-1 < x < 2$; all numbers between -1 and 2, excluding both -1 and 2
16. $5 \le x < \infty$, or $x \ge 5$; all numbers greater than or equal to 5
17. $(-3, \infty)$; all numbers greater than -3
18. $(-7, -2)$; all numbers between -7 and -2, excluding both -7 and -2
19. $(-2, 1)$; all numbers between -2 and 1, excluding both -2 and 1
20. $[-1, \infty)$; all numbers greater than or equal to -1
21. $(-3, 4]$; all numbers between -3 and 4, excluding -3 and including 4
22. $(0, \infty)$; all numbers greater than 0
23. The real numbers greater than 4 and less than or equal to 9.
24. The real numbers greater than or equal to -1, or the real numbers which are at least -1.
25. The real numbers greater than or equal to -3, or the real numbers which are at least -3.
26. The real numbers between -5 and 7, or the real numbers greater than -5 and less than 7.
27. The real numbers greater than -1.
28. The real numbers between -3 and 0 (inclusive), or greater than or equal to -3 and less than or equal to 0.
29. $-3 < x \le 4$; endpoints -3 and 4; bounded; half-open
30. $-3 < x < -1$; endpoints -3 and -1; bounded; open
31. $x < 5$; endpoint 5; unbounded; open
32. $x \ge -6$; endpoint -6; unbounded; closed
33. His age must be greater than or equal to 29: $x \ge 29$ or $[29, \infty)$; $x =$ Bill's age
34. The costs are between 0 and 2 (inclusive): $0 \le x \le 2$ or $[0, 2]$; $x =$ cost of an item
35. The prices are between \$1.099 and \$1.399 (inclusive): $1.099 \le x \le 1.399$ or $[1.099, 1.399]$; $x =$ \$ per gallon of gasoline
36. The raises are between 0.02 and 0.065: $0.02 < x < 0.065$ or $(0.02, 0.065)$; $x =$ average percent of all salary raises
37. $a(x^2 + b) = a \cdot x^2 + a \cdot b = ax^2 + ab$
38. $(y - z^3)c = y \cdot c - z^3 \cdot c = yc - z^3c$
39. $ax^2 + dx^2 = a \cdot x^2 + d \cdot x^2 = (a + d)x^2$
40. $a^3z + a^3w = a^3 \cdot z + a^3 \cdot w = a^3(z + w)$
41. The opposite of $6 - \pi$, or $-(6 - \pi) = -6 + \pi = \pi - 6$
42. The opposite of -7, or $-(-7) = 7$
43. In -5^2, the base is 5.
44. In $(-2)^7$, the base is -2.