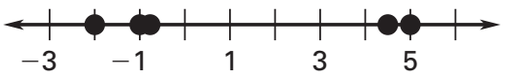
Answers for 1.1

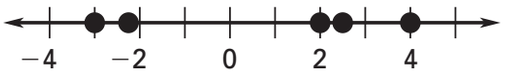
For use with pages 6–9

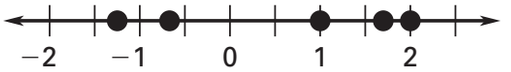
1.1 Skill Practice

1. reciprocal

2. *Sample answer:* If three numbers are being added together, it does not matter which two numbers are added together first.

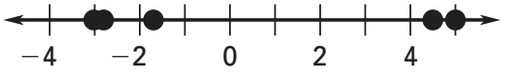
3. 

4. 

5. 

6. 

7. 

8. 

9. B

10. D

11. Associative property of addition

12. Identity property of multiplication

13. Commutative property of multiplication

14. Inverse property of addition

15. Distributive property

16. Associative property of multiplication

17. $6 \cdot (a \div 3) = 6 \cdot \left(a \cdot \frac{1}{3}\right)$

Definition of division

$= 6 \cdot \left(\frac{1}{3} \cdot a\right)$

Commutative property of multiplication

$= \left(6 \cdot \frac{1}{3}\right) \cdot a$

Associative property of multiplication

$= 2a$

Multiplication

18. $15 \cdot (3 \div b) = 15 \cdot \left(3 \cdot \frac{1}{b}\right)$

Definition of division

$= (15 \cdot 3) \cdot \frac{1}{b}$

Associative property of multiplication

$= 45 \cdot \frac{1}{b}$

Multiplication

$= 45 \div b$

Definition of division

19. $(c - 3) + 3 = (c + (-3)) + 3$

Definition of subtraction

$= c + ((-3) + 3)$

Associative property of addition

$= c + 0$

Inverse property of addition

$= c$

Identity property of addition

20. $(a + b) - c = (a + b) + (-c)$

Definition of subtraction

$= a + (b + (-c))$

Associative property of addition

$= a + (b - c)$

Definition of subtraction

21. $7a + (4 + 5a) = 7a + (5a + 4)$

Commutative property of addition

$= (7a + 5a) + 4$

Associative property of addition

$= 12a + 4$

Combine like terms.

22. $(12b + 15) - 3b$
$= (12b + 15) + (-3b)$

Definition of Subtraction

$= (15 + 12b) + (-3b)$

Commutative property of addition

$= 15 + (12b + (-3b))$

Associative property of addition

$= 15 + 9b$

Combine like terms

23. *Sample answer:* $a = -2, b = \frac{1}{4}$

24. *Sample answer:*

$3(4 + 8) = 3 \cdot 4 + 3 \cdot 8 = 36,$

$(1 + 8) \cdot 5 = 1 \cdot 5 + 8 \cdot 5 = 45,$

$-6(4 - 7)$
$= -6 \cdot 4 + (-6) \cdot (-7) = 18$

25. \$8.50/h

26. 40 km/h

27. \$36.25

28. \$7.50

29. 195 mi

30. 3.5 h

31. $116\frac{2}{3}$ yd

32. 15,000 mm

33. 2200 g

34. 300 min

35. 1.75 gal

36. 7000 lb

37. 0.00175 ton

38. $1\frac{8}{9}$ h

39. The unit multiplier should be $\frac{0.82 \text{ euro}}{1 \text{ dollar}}$;

$$25 \text{ dollars} \cdot \frac{0.82 \text{ euro}}{1 \text{ dollar}} = 20.5 \text{ euros.}$$

40. The unit multiplier should be $\frac{2 \text{ cups}}{1 \text{ pint}}$;

$$5 \text{ pints} \cdot \frac{2 \text{ cups}}{1 \text{ pint}} = 10 \text{ cups.}$$

41. about 29.3 ft/sec

42. about 4.1 mi/h

43. about 31.1 mi/h

44. 64.4 km/h

45. about 0.04 oz/sec

46. 168.75 gal/h

47. 1800 mi/h

48. about 5.7 mi/h

49. Always; this represents the associative property of addition, which is true for all real numbers.

50. Always; this represents the associative property of multiplication, which is true for all real numbers.

51. Sometimes; it is true when $c = 0$.

52. Sometimes; it is true when $c = 1$ or $c = -1$.

53. Always; this represents the distributive property, which is true for all real numbers.

54. Sometimes; it is true when $a = 1$.

55. $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \cdot \frac{d}{c}$

Definition of division

$= \frac{ad}{bc}$

Definition of multiplication of fractions

$= \frac{ad}{cb}$

Commutative property of multiplication

$= \frac{a}{c} \cdot \frac{d}{b}$

Definition of multiplication of fractions

$= \frac{a}{c} \div \frac{b}{d}$

Definition of division

56. $\frac{ad + bc}{2bd}$

1.1 Problem Solving

57. a. Lance: 6, Darcy: 2, Javier: 3, Sandra: -2

b. Sandra, Darcy, Javier, Lance

58. -137, -59, 610, 641, 1718, 1733, 3976

59. a. Pluto, Neptune, Uranus, Saturn, Jupiter, Mars, Earth, Mercury, Venus

b. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto

c. *Sample answer:* The planets are in opposite orders in parts (a) and (b) with the exception of Mercury and Venus.

d. Mercury or Venus

60. a. 240,000 lb; 0.004375 lb

b. about 54,857,143 times

c. *Sample answer:* You could convert the weights to ounces and then compare them.

61. a. 102.67; 0.15; 17.6; 30

b. *Sample answer:* The cheetah is about 467 times faster than the three-toed sloth.

62. a. 0.724628

b. 0.185190

1.1 Mixed Review

63. -8

64. 32

65. -5

66. 7

67. -21

68. 7

69. $n + 9$

70. $n - 5$

71. $0.75n$

72. $7n$

73. $0.5n$

74. n^2

75. 32 cm

76. 8 yd

77. 38 m

78. 84 ft^2

79. 12 m^2

80. 15 $in.^2$