

1. Place the correct symbol,  $<$  or  $>$ , between the two numbers.

$$-22 \quad \underline{\hspace{1cm}} \quad 4$$

- A)  $-22 < 4$
- B)  $-22 > 4$

2. Place the correct symbol,  $<$  or  $>$ , between the two numbers:  $53 \quad 33$ .

- A)  $53 < 33$
- B)  $53 > 33$

3. Place the correct symbol,  $<$  or  $>$ , between the two numbers.

$$-25 \quad \underline{\hspace{1cm}} \quad -45$$

- A)  $-25 < -45$
- B)  $-25 > -45$

4. Place the correct symbol,  $<$  or  $>$ , between the two numbers.

$$-4 \quad \underline{\hspace{1cm}} \quad -15$$

- A)  $-4 < -15$
- B)  $-4 > -15$

5. Let  $x \in \{-10, -4, 9\}$ . For which values of  $x$  is  $x < -4$  true?

- A) 9
- B)  $-10, -4, 9$
- C)  $-10$
- D)  $-10, -4$
- E)  $-10, 9$

6. Let  $y \in \{-11, -6, 4\}$ . For which values of  $y$  is  $y > -6$  true?

- A) 4
- B)  $-6$
- C)  $-11$
- D)  $-11, -6$
- E)  $-11, -6, 4$

7. Find the additive inverse of 7.

- A)  $\frac{1}{7}$
- B)  $-7$
- C)  $-\frac{1}{7}$
- D) 0
- E) 7

8. Find the additive inverse of  $-3$ .

- A)  $\frac{1}{3}$
- B) 3
- C)  $-\frac{1}{3}$
- D) 0
- E)  $-3$

9. Evaluate:

$$-(-88)$$

- A) 88
- B)  $-88$
- C)  $-87$
- D) 89
- E) 87

10. Evaluate:

$$-(53)$$

- A)  $-53$
- B) 53
- C)  $-52$
- D) 52
- E)  $-54$

11. Evaluate:

$$|-85|$$

- A) 85
- B) -85
- C) 86
- D) -84
- E) 84

12. Evaluate:

$$-|-57|$$

- A) 57
- B) -57
- C) -56
- D) 58
- E) 56

13. Evaluate:

$$-|83|$$

- A) 83
- B) -83
- C) -82
- D) 84
- E) 82

14. Place the correct symbol, < or >, between the two numbers.

$$|-50| \text{ \_\_\_\_ } |8|$$

- A)  $|-50| < |8|$
- B)  $|-50| > |8|$

15. Place the correct symbol, < or >, between the two numbers.

$$|90| \text{ \_\_\_\_ } |-45|$$

- A)  $|90| < |-45|$
- B)  $|90| > |-45|$

16. Place the correct symbol,  $<$  or  $>$ , between the two numbers.

$$|-47| \text{ \_\_\_\_ } |-77|$$

- A)  $|-47| < |-77|$
- B)  $|-47| > |-77|$

17. Let  $b \in \{-12, 0, 4\}$ . Evaluate  $-b$  for each element of the set.

- A) 12, 0, -4
- B) -12, 0, 4
- C) -12, 0, -4
- D) 12, 0, 4
- E) 12, 1, -4

18. Add.

$$-1 + (-18)$$

- A) -17
- B) -19
- C) 17
- D) 19
- E) 10

19. Add:

$$-12 + (-2)$$

- A) 10
- B) 14
- C) -14
- D) -10
- E) -6

20. Add:

$$-3 + 8$$

- A) 11
- B) 5
- C) -11
- D) -5
- E) 7

21. Add:

$$-15 + 17$$

- A) -32
- B) 32
- C) -2
- D) 2
- E) 3

22. Add:

$$16 + (-16)$$

- A) 32
- B) -48
- C) 0
- D) -32
- E) 24

23. Add:

$$36 + (-21)$$

- A) 57
- B) -78
- C) 15
- D) -15
- E) 39

24. Add:

$$-20 + (-25) + 20$$

- A) -65
- B) 65
- C) 15
- D) -25
- E) -45

25. Add:

$$-11 + (-5) + 14$$

- A) -30
- B) -14
- C) -2
- D) 8
- E) 3

26. Subtract:

$$2 - 21$$

- A) 23
- B) -19
- C) -23
- D) 19
- E) -42

27. Subtract:

$$10 - 23$$

- A) 33
- B) -18
- C) -13
- D) -16
- E) -15

28. Subtract:

$$-18 - 17$$

- A) 35
- B) 1
- C) -35
- D) -1
- E) 306

29. Subtract:

$$12 - (-14)$$

- A) 26
- B) -2
- C) -26
- D) 2
- E) 168

30. Subtract:

$$-12 - (-22)$$

- A) -34
- B) 34
- C) -10
- D) 10
- E) -264

31. Subtract:

$$-3 - (-21)$$

- A) -24
- B) 14
- C) 20
- D) 18
- E) 22

32. Subtract:

$$10 - (-12)$$

- A) -2
- B) 2
- C) 19
- D) 22
- E) 25

33. Subtract:

$$-3 - 30$$

- A) 27
- B) -34
- C) -32
- D) -33
- E) -37

34. Add:

$$1 + (-6) + 7 + (-17)$$

- A) -15
- B) 19
- C) -29
- D) 17
- E) -14

35. Add:

$$-5 + (-20) + 17 + (-11)$$

- A) 26
- B) 31
- C) -19
- D) 35
- E) 19

36. Subtract:

$$15 - (-17) - 4$$

- A) -2
- B) 2
- C) 28
- D) 11
- E) 56

37. Subtract:

$$3 - (-12) - 5 - 5$$

- A) 15
- B) -19
- C) 9
- D) 2
- E) 5

38. Subtract:

$$-14 - (-16) - 9 - 5$$

- A) -12
- B) 44
- C) -2
- D) 5
- E) -4

39. Multiply:

$$(31)20$$

- A) 620
- B) 608
- C) 594
- D) 630
- E) 638

40. Multiply:

$$-10 \cdot 17$$

- A) 7
- B) -160
- C) -7
- D) -170
- E) -27



41. Multiply:

$$(-19)(-15)$$

- A) -285
- B) 288
- C) 285
- D) -280
- E) 273

42. Multiply:

$$(-14)(-22)$$

- A) 308
- B) 8
- C) -36
- D) 36
- E) -8

43. Multiply:

$$-14(16)$$

- A) 225
- B) -224
- C) -216
- D) -221
- E) 224

44. Multiply:

$$-8 \cdot (25)$$

- A) 17
- B) 33
- C) -33
- D) 200
- E) -200

45. Divide:

$$48 \div (-8)$$

- A)  $-6$
- B)  $6$
- C)  $-\frac{1}{6}$
- D)  $\frac{1}{6}$
- E)  $-384$

46. Divide:

$$(-144) \div (-18)$$

- A)  $8$
- B)  $-8$
- C)  $\frac{1}{8}$
- D)  $-\frac{1}{8}$
- E)  $2592$

47. Divide:

$$-165 \div 11$$

- A)  $-\frac{1}{15}$
- B)  $15$
- C)  $-13$
- D)  $\frac{1}{15}$
- E)  $-15$

48. Divide:

$$\begin{array}{r} -88 \\ -11 \end{array}$$

- A)  $\frac{1}{8}$
- B)  $-8$
- C)  $8$
- D)  $-\frac{1}{8}$
- E)  $-99$

49. Divide:

$$\begin{array}{r} 221 \\ -17 \end{array}$$

- A)  $-13$
- B)  $\frac{1}{13}$
- C)  $-\frac{1}{13}$
- D)  $13$
- E)  $204$

50. Divide:

$$\begin{array}{r} -165 \\ -11 \end{array}$$

- A)  $-\frac{1}{15}$
- B)  $15$
- C)  $\frac{1}{15}$
- D)  $-15$
- E)  $-154$

51. Divide to evaluate  $0 \div (-11)$ .

- A)  $11$
- B)  $4$
- C)  $0$
- D)  $-2$
- E) Undefined

52. Divide:

$$\frac{-176}{8}$$

- A)  $\frac{1}{22}$
- B) 22
- C) -22
- D)  $-\frac{1}{22}$
- E) -168

53. Divide:

$$13 \div 0$$

- A) -13
- B)  $\frac{1}{13}$
- C)  $-\frac{1}{13}$
- D) 0
- E) Undefined

54. Multiply:

$$8(12)(-8)$$

- A) 768
- B) -864
- C) 32
- D) -768
- E) -672

55. Multiply:

$$1(-4)(-6)$$

- A) -18
- B) 3
- C) -10
- D) -9
- E) 24

56. Multiply:

$$(-8)^{11}(-6)^2$$

- A) -140
- B) -100
- C) -80
- D) 2
- E) 1056

57. The temperature at which mercury boils is  $360^{\circ}\text{C}$ . Mercury freezes at  $-39^{\circ}\text{C}$ . Find the difference between the temperature at which mercury boils and the temperature at which it freezes.

- A)  $-399^{\circ}\text{C}$
- B)  $399^{\circ}\text{C}$
- C)  $398^{\circ}\text{C}$
- D)  $400^{\circ}\text{C}$
- E)  $100^{\circ}\text{C}$

58. Find the temperature after a rise of  $10^{\circ}\text{C}$  from  $-25^{\circ}\text{C}$ .

- A)  $-15^{\circ}\text{C}$
- B)  $-35^{\circ}\text{C}$
- C)  $15^{\circ}\text{C}$
- D)  $-10^{\circ}\text{C}$
- E)  $35^{\circ}\text{C}$

59. The daily low temperatures during one week were recorded as follows:  $8^{\circ}\text{F}$ ,  $-1^{\circ}\text{F}$ ,  $12^{\circ}\text{F}$ ,  $3^{\circ}\text{F}$ ,  $-8^{\circ}\text{F}$ ,  $-10^{\circ}\text{F}$ ,  $-4^{\circ}\text{F}$ . Find the average daily low temperature for the week.

- A)  $-1^{\circ}\text{F}$
- B)  $-4^{\circ}\text{F}$
- C)  $0^{\circ}\text{F}$
- D)  $5^{\circ}\text{F}$
- E)  $1^{\circ}\text{F}$

60. The low temperatures for a 10-day period in a midwestern city were  $-6^{\circ}\text{F}$ ,  $-11^{\circ}\text{F}$ ,  $-7^{\circ}\text{F}$ ,  $-4^{\circ}\text{F}$ ,  $2^{\circ}\text{F}$ ,  $-3^{\circ}\text{F}$ ,  $-3^{\circ}\text{F}$ ,  $-4^{\circ}\text{F}$ ,  $-4^{\circ}\text{F}$ ,  $0^{\circ}\text{F}$ . Calculate the average daily low temperature for this city.
- A)  $-6^{\circ}\text{F}$
  - B)  $2^{\circ}\text{F}$
  - C)  $-4^{\circ}\text{F}$
  - D)  $-3^{\circ}\text{F}$
  - E)  $0^{\circ}\text{F}$
61. The combined scores of the top eight golfers in a tournament equalled  $-32$  (32 under par). What was the average score of the eight golfers?
- A)  $-16$
  - B)  $-4$
  - C)  $1$
  - D)  $16$
  - E)  $-32$
62. To discourage guessing on a multiple-choice exam, a professor assigns 4 points for a correct answer,  $-2$  points for an incorrect answer, and  $-1$  point for leaving the question blank. What is the score for a student who had 18 correct answers, had 8 incorrect answers, and left 4 questions blank?
- A) 52
  - B) 60
  - C) 84
  - D) 56
  - E) 36
63. Convert the fraction to a decimal.
- $$\frac{3}{8}$$
- A) 0.465
  - B) 0.375
  - C) 0.475
  - D) 0.0375
  - E) 0.0475

64. Write the following fraction as a decimal.

$$\frac{8}{20}$$

- A) 0.3
- B) 0.42
- C) 0.46
- D) 2.5
- E) 0.4

65. Write the following fraction as a decimal.

$$\frac{12}{48}$$

- A) 0.15
- B) 1.2
- C) 0.34
- D) 4.0
- E) 0.25

66. Write 75% as a fraction and as a decimal.

- A)  $\frac{15}{2}$  ; 75
- B)  $\frac{4}{3}$  ; 0.75
- C)  $\frac{3}{4}$  ; 0.75
- D)  $\frac{1}{75}$  ; 7.5
- E)  $\frac{2}{15}$  ; 7.5

67. Write 125% as a fraction and as a decimal.

- A)  $1\frac{1}{4}$  ; 0.25
- B)  $1\frac{1}{4}$  ; 1.25
- C)  $\frac{4}{5}$  ; 0.125
- D)  $\frac{1}{8}$  ; 12.5
- E)  $1\frac{1}{4}$  ; 125

68. Write 14% as a fraction and as a decimal.

- A)  $\frac{5}{7}$  ; 1.4
- B)  $\frac{7}{50}$  ; 14
- C)  $\frac{1}{14}$  ; 1.4
- D)  $\frac{50}{7}$  ; 0.14
- E)  $\frac{7}{50}$  ; 1400

69. Write  $11\frac{3}{8}\%$  as a fraction.

- A)  $\frac{91}{400}$
- B)  $\frac{91}{8}$
- C)  $\frac{17}{16}$
- D)  $\frac{91}{800}$
- E)  $\frac{17}{1600}$



70. Write  $5\frac{7}{9}\%$  as a fraction.

- A)  $\frac{13}{225}$
- B)  $\frac{26}{225}$
- C)  $\frac{52}{9}$
- D)  $\frac{4}{3}$
- E)  $\frac{1}{75}$

71. Write  $12\frac{5}{14}\%$  as a fraction.

- A)  $\frac{173}{700}$
- B)  $\frac{173}{14}$
- C)  $\frac{17}{14}$
- D)  $\frac{173}{1400}$
- E)  $\frac{17}{1400}$

72. Write 5.5% as a decimal.

- A) 55
- B) 0.055
- C) 5.5
- D) 0.55
- E) 550

73. Write 45.1% as a decimal.

- A) 451
- B) 0.0451
- C) 45.1
- D) 4.51
- E) 0.451

74. Write 9.35% as a decimal.

- A) 93.5
- B) 0.935
- C) 9.35
- D) 0.0935
- E) 935

75. Write 9.35% as a decimal.

- A) 0.0935
- B) 0.935
- C) 9.35
- D) 93.5
- E) 935

76. Write 0.59 as a percent.

- A) 0.059 %
- B) 5.9 %
- C) 0.59 %
- D) 59 %
- E) 0.0059 %

77. Write 0.45 as a percent.

- A) 4.5 %
- B) 45 %
- C) 0.45 %
- D) 0.045 %
- E) 0.0045 %

78. Write 0.667 as a percent.

- A) 0.00667 %
- B) 6.67 %
- C) 0.667 %
- D) 66.7 %
- E) 0.0667 %

79. Write  $\frac{43}{50}$  as a percent.

- A) 43 %
- B) 86 %
- C) 1.16 %
- D) 430 %
- E) 8.6 %

80. Write  $\frac{1}{9}$  as a percent. Round to the nearest tenth of a percent, if necessary.

- A) 4.5 %
- B) 9 %
- C) 0.1 %
- D) 1.1 %
- E) 11.1 %

81. Write  $\frac{5}{9}$  as a percent. Round to the nearest tenth of a percent, if necessary.

- A) 5.6%
- B) 18.0%
- C) 55.6%
- D) 0.6%
- E) 1.8%

82. Write  $5\frac{6}{7}$  as a percent. Round to the nearest tenth of a percent, if necessary.

- A) 585.7 %
- B) 157.1 %
- C) 35.9 %
- D) 5.9 %
- E) 24.3 %

83.  $1\frac{3}{4}$

Write  $1\frac{3}{4}$  as a percent. Write the remainder (if there is a remainder) in fractional form.

A)  $134\%$

B)  $175\%$

C)  $100\frac{3}{4}\%$

D)  $1\frac{3}{4}\%$

E)  $7\frac{3}{4}\%$

84. Subtract.

$$-\frac{1}{6} - \frac{4}{23}$$

A)  $-\frac{47}{138}$

B)  $-\frac{5}{138}$

C)  $\frac{3}{29}$

D)  $\frac{1}{138}$

E)  $\frac{5}{17}$

85. Add the following rational numbers.

$$-\frac{1}{2} + \frac{2}{7}$$

A)  $-\frac{1}{3}$

B)  $-\frac{11}{14}$

C)  $-\frac{1}{5}$

D)  $-\frac{3}{14}$

E)  $\frac{1}{42}$

86. Add the following rational numbers.

$$-\frac{3}{2} + \frac{2}{21}$$

A)  $-\frac{5}{23}$

B)  $-\frac{67}{42}$

C)  $\frac{1}{19}$

D)  $-\frac{59}{42}$

E)  $-\frac{1}{42}$

87. Subtract.

$$\frac{3}{10} - \left(-\frac{6}{7}\right)$$

A)  $\frac{9}{70}$

B)  $\frac{13}{35}$

C)  $\frac{81}{70}$

D)  $\frac{72}{17}$

E)  $\frac{9}{17}$

88. Subtract.

$$\frac{1}{8} - \frac{2}{19}$$

A)  $\frac{35}{152}$

B)  $\frac{1}{11}$

C)  $\frac{3}{152}$

D)  $-\frac{1}{152}$

E)  $\frac{1}{9}$

89. Subtract.

$$-\frac{6}{19} - \left(-\frac{3}{8}\right)$$

A)  $\frac{105}{152}$

B)  $\frac{3}{11}$

C)  $\frac{9}{152}$

D)  $-\frac{3}{152}$

E)  $\frac{1}{3}$

90. Add the following rational numbers.

$$-\frac{1}{2} + \frac{6}{25} + \left(-\frac{3}{10}\right)$$

A)  $-\frac{653}{2500}$

B)  $-\frac{2}{45}$

C)  $-\frac{2}{5}$

D)  $-\frac{14}{25}$

E)  $-\frac{1}{1250}$

91. Add the following numbers.

$$-92.04 + 20.01 + (-47.81)$$

A)  $-159.86$

B)  $-24.22$

C)  $-119.84$

D)  $-119.64$

E)  $-24.24$

92. Subtract.

$$-96.55 - (-22.28) - 46.58$$

- A)  $-165.41$
- B)  $-27.69$
- C)  $-120.85$
- D)  $-120.65$
- E)  $-27.71$

93. Multiply:

$$\left(-\frac{3}{4}\right) \cdot \left(-\frac{4}{15}\right)$$

- A)  $-\frac{7}{60}$
- B)  $\frac{7}{11}$
- C)  $-\frac{61}{60}$
- D)  $\frac{1}{5}$
- E)  $-\frac{6}{5}$

94. Multiply:

$$\frac{7}{15} \cdot \left(-\frac{4}{5}\right)$$

- A)  $-\frac{7}{12}$
- B)  $\frac{1}{25}$
- C)  $-\frac{28}{75}$
- D)  $-\frac{1}{3}$
- E)  $-\frac{4}{21}$



95. Multiply:

$$\left(-\frac{4}{5}\right)\frac{1}{6}\left(-\frac{2}{13}\right)$$

- A)  $\frac{6}{17}$
- B)  $-\frac{3}{4}$
- C)  $\frac{4}{195}$
- D)  $\frac{7}{59}$
- E)  $-\frac{1}{2}$

96. Divide:

$$-\frac{1}{8} \div \frac{11}{2}$$

- A)  $-\frac{1}{44}$
- B)  $-\frac{11}{16}$
- C)  $-\frac{5}{8}$
- D)  $-\frac{2}{3}$
- E)  $\frac{1}{3}$

97. Divide:

$$\frac{3}{10} \div \left( -\frac{15}{4} \right)$$

- A)  $-\frac{9}{8}$
- B)  $-\frac{3}{10}$
- C)  $-\frac{2}{25}$
- D)  $\frac{1}{5}$
- E)  $-\frac{12}{5}$

98. Divide:

$$\left( -\frac{1}{6} \right) \div \left( -\frac{2}{11} \right)$$

- A)  $\frac{5}{2}$
- B)  $\frac{17}{3}$
- C)  $-\frac{1}{5}$
- D)  $\frac{11}{12}$
- E)  $\frac{3}{5}$

99. Evaluate:

$$-0.32(-0.28)$$

- A)  $-0.6$
- B)  $0.0896$
- C)  $0.04$
- D)  $0.896$
- E)  $8.96$

100. Evaluate the following, giving your answer to the nearest thousandth.

$$-0.141 \div (-9.65)$$

- A) 68.440
- B) -9.791
- C) -9.509
- D) 9.509
- E) 0.015

101. Evaluate  $2^3$ .

- A) 9
- B) 8
- C) 2
- D) 3
- E) 6

102. Evaluate  $-4^3$ .

- A) 64
- B) -64
- C) 81
- D) -81
- E) 12

103. Evaluate  $(-3)^4$ .

- A) 81
- B) -81
- C) -64
- D) 64
- E) 12

104. Simplify:

$$\left(\frac{3}{7}\right)^2$$

- A)  $\frac{18}{49}$
- B)  $\frac{9}{49}$
- C)  $\frac{9}{98}$
- D)  $\frac{3}{7}$
- E)  $\frac{3}{49}$

105. Simplify:

$$\left(-\frac{3}{7}\right)^4$$

- A)  $\frac{81}{2401}$
- B)  $-\frac{81}{2401}$
- C)  $-\frac{2401}{81}$
- D)  $\frac{162}{7}$
- E) Undefined

106. Simplify:

$$\sqrt{36}$$

- A) 36
- B) 6
- C)  $6\sqrt{3}$
- D)  $3\sqrt{6}$
- E) 3

107. Simplify:

$$\sqrt{320}$$

- A)  $8\sqrt{5}$
- B)  $5\sqrt{32}$
- C) 40
- D)  $5\sqrt{8}$
- E)  $8\sqrt{40}$

108. Simplify:

$$-11\sqrt{128}$$

- A)  $-88\sqrt{2}$
- B)  $-16\sqrt{11}$
- C) -16
- D)  $-44\sqrt{2}$
- E)  $-4\sqrt{11}$

109. On January 23, 1916, the temperature in Browning, Montana, was  $6.5^{\circ}\text{C}$ . On January 24, 1916, the temperature was  $-48.68^{\circ}\text{C}$ . Find the difference between the temperatures in Browning on these two days.

- A)  $42.18^{\circ}\text{C}$
- B)  $-55.18^{\circ}\text{C}$
- C)  $-42.18^{\circ}\text{C}$
- D)  $55.18^{\circ}\text{C}$
- E)  $27.59^{\circ}\text{C}$

110. The boiling point of oxygen is  $-182.962^{\circ}\text{C}$  and the melting point is  $-218.4^{\circ}\text{C}$ . Find the difference between the boiling point and the melting point of oxygen.

- A)  $-200.681^{\circ}\text{C}$
- B)  $401.362^{\circ}\text{C}$
- C)  $35.438^{\circ}\text{C}$
- D)  $-35.438^{\circ}\text{C}$
- E)  $-401.362^{\circ}\text{C}$

111. Evaluate the following expression using the Order of Operations Agreement.

$$4(5 - 3) - (-2)^3$$

- A) 25
- B) 16
- C) 0
- D) 40
- E) -24

112. Evaluate the following expression using the Order of Operations Agreement.

$$38 - 162 \div (-3^4)$$

- A)  $-\frac{13084}{81}$
- B)  $-\frac{124}{81}$
- C) 36
- D) 40
- E) -205

113. Evaluate the following expression using the Order of Operations Agreement.

$$-19^2 + 5[4 \div (4 - 2)]$$

- A) 371
- B) -9
- C) -351
- D) -712
- E) -28

114. Evaluate the following expression using the Order of Operations Agreement.

$$6 \div \frac{3^2}{9 - 6} - (-10)$$

- A) -8
- B) 12
- C) 22
- D) 2
- E)  $-\frac{46}{27}$

115. Evaluate the following expression using the Order of Operations Agreement.

$$7[33 - (3 - 2)] \div 8$$

- A)  $\frac{113}{4}$
- B)  $\frac{115}{4}$
- C)  $\frac{49}{2}$
- D) 28
- E)  $\frac{911}{4}$

116. Evaluate the following expression using the Order of Operations Agreement.

$$6 \div (65 - 4^3) + (-16)$$

- A) -10
- B)  $-\frac{5194}{65}$
- C)  $-\frac{2}{5}$
- D)  $\frac{6}{17}$
- E)  $-\frac{3114}{65}$

117. Evaluate the following expression using the Order of Operations Agreement.

$$8 - 7(5 - 2)^5 \div 3$$

- A) 81
- B) -559
- C)  $-\frac{59}{3}$
- D)  $-\frac{14}{3}$
- E)  $-\frac{113}{3}$

118. Evaluate the following expression using the Order of Operations Agreement.

$$49(-343) \div [7(10-3)^3]$$

- A)  $-\frac{6}{49}$
- B)  $-14,406$
- C)  $-7$
- D)  $-882$
- E)  $-\frac{294}{43}$

119. Evaluate the variable expression when  $a = 8$ ,  $b = -3$ , and  $c = -8$ .

$$6ab - 6c^2$$

- A)  $-533$
- B)  $-528$
- C)  $-48$
- D)  $-96$
- E)  $-144$

120. Evaluate the variable expression when  $a = 6$ ,  $b = 3$ , and  $c = -8$ .

$$c^2 - a^2$$

- A)  $-28$
- B)  $26$
- C)  $28$
- D)  $56$
- E)  $30$

121. Evaluate the variable expression when  $a = -8$ ,  $b = 3$ ,  $c = -8$ , and  $d = 6$ .

$$(b+d)^2 - 6a$$

- A)  $-129$
- B)  $129$
- C)  $33$
- D)  $258$
- E)  $-126$



122. Evaluate the variable expression when  $a = -8$ ,  $b = 9$ ,  $c = -12$ , and  $d = 8$ .

$$\frac{b^2 - c}{ad + 9c}$$

- A)  $\frac{1}{172}$
- B)  $\frac{1}{9}$
- C) 1
- D)  $-\frac{93}{172}$
- E) Undefined

123. Simplify:

$$8x + 11x$$

- A)  $19x$
- B)  $88x$
- C)  $18x$
- D)  $88x^2$
- E)  $19x^2$

124. Simplify:

$$-11y - 12y$$

- A)  $-23y$
- B)  $23y^2$
- C)  $-23y^2$
- D)  $23y$
- E)  $132y$

125. Simplify:

$$-6yt + 3yt$$

- A)  $3yt^2$
- B)  $-3yt^2$
- C)  $-9yt$
- D)  $-3yt$
- E)  $3yt$

126. Simplify:

$$5t - 4t - 8t$$

- A)  $-7t$
- B)  $-13t$
- C)  $-8t$
- D)  $-6t$
- E)  $t$

127. Simplify:

$$2t^2 - 3t^2 - 6t^2$$

- A)  $-7t^2$
- B)  $-4t^2$
- C)  $-3t^2$
- D)  $-t^2$
- E)  $7t^2$

128. Simplify:

$$7w - 4u + 8w$$

- A)  $15w + 4u$
- B)  $w - 4u$
- C)  $11w + 4u$
- D)  $15w - 4u$
- E)  $11w - 4u$

129. Simplify:

$$7y - 2z - 2y + 9z$$

- A)  $5y + 7z$
- B)  $-y + 7z$
- C)  $5y - 7z$
- D)  $-y - 7z$
- E)  $3y + 9z$

130. Simplify:

$$9y - 3z - 8y + 7z$$

- A)  $y + 4z$
- B)  $-6y + 4z$
- C)  $y - 4z$
- D)  $-6y - 4z$
- E)  $-2y + 7z$

131. Simplify the following expression.

$$7(9x)$$

- A)  $16x$
- B)  $63x$
- C)  $9x$
- D)  $7x$
- E)  $2x$

132. Simplify the following expression.

$$-8(3z)$$

- A)  $11z$
- B)  $24$
- C)  $24z$
- D)  $-24z$
- E)  $-5z$

133. Simplify the following expression.

$$-4(-7y)$$

- A)  $28y$
- B)  $28$
- C)  $7y$
- D)  $-28y$
- E)  $3y$

134. Simplify the following expression.

$$(8x)5$$

- A)  $13x$
- B)  $40x$
- C)  $8x$
- D)  $80$
- E)  $14x$

135. Simplify the following expression.

$$(8b)(-3)$$

- A)  $11b$
- B)  $24$
- C)  $-8b$
- D)  $-24b$
- E)  $-5b$

136. Simplify the following expression.

$$(-8y)(-10)$$

- A)  $80y$
- B)  $-18y$
- C)  $18y$
- D)  $-80y$
- E)  $-2y$

137. Simplify the following expression.

$$-9(3b^2)$$

- A)  $-27b^2$
- B)  $-27$
- C)  $27b$
- D)  $-27b$
- E)  $27b^2$

138. Simplify the following expression.

$$\frac{1}{5}(15y^2)$$

- A)  $75y^2$
- B)  $3$
- C)  $3y^2$
- D)  $75y$
- E)  $10y^2$

139. Simplify the following expression.

$$(35a)\frac{1}{5}$$

- A)  $7$
- B)  $175$
- C)  $7a^2$
- D)  $7a$
- E)  $30a$

140. Simplify the following expression.

$$(-36z)\left(-\frac{3}{4}\right)$$

- A)  $27z$
- B)  $144z$
- C)  $27z^2$
- D)  $9$
- E)  $9z$

141. Simplify the following expression.

$$\frac{1}{7}(70a)$$

- A)  $10$
- B)  $490$
- C)  $63a^2$
- D)  $10a$
- E)  $63a$

142. Simplify the following expression.

$$-5(y+7)$$

- A)  $-5y+35$
- B)  $-5y-7$
- C)  $-5y+7$
- D)  $-5y-35$
- E)  $5y+35$

143. Simplify the following expression.

$$-5(6y-10)$$

- A)  $-5y+50$
- B)  $-30y-10$
- C)  $-30y+50$
- D)  $-30y-50$
- E)  $30y+50$

144. Simplify the following expression.

$$-(z + 7)$$

- A)  $-z + 7$
- B)  $-z - 7$
- C)  $z + 7$
- D)  $z - 7$
- E)  $7$

145. Simplify the following expression.

$$(3 - 4a)6$$

- A)  $3 - 24a$
- B)  $18 - 4a$
- C)  $18 - 6a$
- D)  $18 + 24a$
- E)  $18 - 24a$

146. Simplify the following expression.

$$7(4x^2 + 5y)$$

- A)  $28x^2 + 7y$
- B)  $28x^2 + 5y$
- C)  $28x^2 - 35y$
- D)  $28x^2 + 35y$
- E)  $7x^2 + 35y$

147. Simplify the following expression.

$$-3(-z + 8)$$

- A)  $3z - 3$
- B)  $3z - 24$
- C)  $3z - 8$
- D)  $3z + 24$
- E)  $-3z - 24$

148. Simplify the following expression.

$$-\frac{6}{9}(45p - 90)$$

- A)  $-5p + 10$
- B)  $-30p + 10$
- C)  $-30p - 60$
- D)  $-30p + 60$
- E)  $-6p - 60$

149. Simplify the following expression.

$$3(5p^2 - p + 6)$$

- A)  $15p^2 - 3p + 6$
- B)  $15p^2 + 15p + 18$
- C)  $15p^2 + 3p + 18$
- D)  $3p^2 - 3p + 18$
- E)  $15p^2 - 3p + 18$

150. Simplify the following expression.

$$5(3y^2 - y + 6)$$

- A)  $15y^2 - 5y + 30$
- B)  $15y^2 + 15y + 30$
- C)  $15y^2 + 5y + 30$
- D)  $5y^2 - 5y + 30$
- E)  $15y^2 - 5y + 6$

151. Simplify the following expression.

$$3(-2a^2 - ay + 4y^2)$$

- A)  $-6a^2 - 3ay + 12y^2$
- B)  $-6a^2 - 6ay + 12y^2$
- C)  $-6a^2 + 3ay + 12y^2$
- D)  $3a^2 - 3ay + 12$
- E)  $-6a^2 - 3a + 12y^2$

152. Simplify the following expression.

$$-(4x^2 - x + 10)$$

- A)  $-4x^2 - x + 10$
- B)  $4x^2 - x + 10$
- C)  $-4x^2 + x - 10$
- D)  $-4x^2 - x - 10$
- E)  $x^2 + x - 10$

153. Simplify the following expression.

$$8y - 2(5y + 7)$$

- A)  $-2y - 14$
- B)  $2y - 14$
- C)  $-2y - 2$
- D)  $-2y + 14$
- E)  $2y + 14$

154. Simplify the following expression.

$$10y - (5y + 4)$$

- A)  $5y - 1$
- B)  $-5y - 4$
- C)  $5y - 4$
- D)  $5y + 4$
- E)  $y + 4$

155. Simplify the following expression.

$$12(z + 6) - 4(z - 9)$$

- A)  $8z$
- B)  $-8z - 108$
- C)  $-8z + 108$
- D)  $8z - 108$
- E)  $8z + 108$



156. Simplify the following expression.

$$4[p - 5(p - 4)]$$

- A)  $-16p$
- B)  $16p - 80$
- C)  $-16p + 80$
- D)  $-16p - 80$
- E)  $16p + 80$

157. Simplify the following expression.

$$2a - 8[a - 4(a - 10)]$$

- A)  $26a$
- B)  $-26a + 320$
- C)  $26a - 320$
- D)  $26a + 320$
- E)  $-26a - 320$

158. Translate the following into a variable expression.

ten minus a number

- A)  $10 - z$
- B)  $10z$
- C)  $z - 10$
- D)  $\frac{z}{10}$
- E)  $z \div 10$

159. Translate the phrase into a mathematical expression.

Two-fifths of a number

- A)  $2x + 5$
- B)  $\frac{5}{2}x$
- C)  $\frac{2}{5}x$
- D)  $5x + 2$
- E)  $\frac{2}{5} + x$

160. Translate the following into a variable expression.  
the quotient of three times a number and ten

- A)  $\frac{3+p}{10}$
- B)  $\frac{3}{10} + p$
- C)  $3 + \frac{p}{10}$
- D)  $\frac{3p}{10}$
- E)  $\frac{10p}{3}$

161. Translate the following into a variable expression. Then simplify.  
twenty times the difference between a number and four

- A)  $4(a-20); 4a-80$
- B)  $20(a-4); 20a-80$
- C)  $20(a+4); 20a+80$
- D)  $4(a+4); 4a+80$
- E)  $20(a-4); 20a-4$

162. Translate the following into a variable expression. Then simplify.  
ten less than the total of a number and six

- A)  $(x+6)-10; x+4$
- B)  $(x+6)-10; x-4$
- C)  $10-(x+6); -4-x$
- D)  $10+(x+6); 16+x$
- E)  $(x+6)-10; x-10$

163. Translate the following into a variable expression. Then simplify.  
a number added to the difference between twice the number and twenty

- A)  $y + (2y - 20)$ ;  $3y + 20$
- B)  $y + (2y + 20)$ ;  $3y + 20$
- C)  $y + (2y - 20)$ ;  $y - 20$
- D)  $y + (2y - 20)$ ;  $3y - 20$
- E)  $y + (20 - 2y)$ ;  $20 - y$

164. Translate the following into a variable expression. Then simplify, if necessary.  
a number added to the product of ten and the number

- A)  $10 + z$
- B)  $10 + z^2$
- C)  $(10z)z$ ;  $10z^2$
- D)  $10z + z$ ;  $11z$
- E)  $10z + z$ ;  $10 + z$

165. Translate the following into a variable expression. Then simplify, if necessary.  
a number increased by the total of the number and two

- A)  $z + (z + 2)$ ;  $2(z + 2)$
- B)  $z + 2$
- C)  $z + (z - 2)$ ;  $2z - 2$
- D)  $z(z + 2)$ ;  $z^2 + 2z$
- E)  $z + (z + 2)$ ;  $2z + 2$

166. Translate the following into a variable expression. Then simplify, if necessary.  
ten more than the sum of a number and five

- A)  $(5 - p) + 10$ ;  $15 - p$
- B)  $(5 + 10)p$ ;  $15p$
- C)  $5p + 10$
- D)  $(5 + p) + 10$ ;  $p + 15$
- E)  $(p - 5) - 10$ ;  $p - 15$

167. Translate the following into a variable expression. Then simplify, if necessary.  
a number decreased by the difference between three and the number

- A)  $y - (3 - y); 2y - 3$
- B)  $y - (y - 3); 3$
- C)  $y - (3 + y); -3$
- D)  $(3 - y) - y; 3 - 2y$
- E)  $0$

168. Use the roster method to write the set consisting of the integers between 26 and 31.

- A)  $\{27, 28, 29, 30\}$
- B)  $\{26, 27, 29, 30, 31\}$
- C)  $\{27, 28, 29, 30, 31\}$
- D)  $\{26, 27, 28, 29, 30, 31\}$
- E)  $\{26, 27, 28, 29, 30\}$

169. Use the roster method to write the set consisting of the integers between  $-11$  and  $-6$ .

- A)  $\{-10, -9, -8, -7\}$
- B)  $\{-11, -10, -8, -7, -6\}$
- C)  $\{-10, -9, -8, -7, -6\}$
- D)  $\{-11, -10, -9, -8, -7, -6\}$
- E)  $\{-11, -10, -9, -8, -7\}$

170. Use the roster method to write the set consisting of the odd integers between 16 and 26.

- A)  $\{17, 19, 21, 25\}$
- B)  $\{19, 21, 23, 25\}$
- C)  $\{17, 19, 21, 23, 25\}$
- D)  $\{16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26\}$
- E)  $\{17, 19, 23, 25\}$

171. Use the roster method to write the set consisting of the even integers between 27 and 37.

- A)  $\{28, 30, 32, 36\}$
- B)  $\{30, 32, 34, 36\}$
- C)  $\{28, 30, 32, 34, 36\}$
- D)  $\{27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37\}$
- E)  $\{28, 30, 34, 36\}$

172. Find  $A \cup B$ .

$$A = \{12, 13, 14\}; \quad B = \{14, 15, 16\}$$

- A)  $A \cup B = \{12, 14, 14, 15, 16\}$
- B)  $A \cup B = \{12, 13, 14, 15, 16\}$
- C)  $A \cup B = \{12, 13, 14, 14, 15\}$
- D)  $A \cup B = \{14, 15, 16\}$
- E)  $A \cup B = \{12, 13, 14, 17, 12\}$

173. Find  $A \cup B$ .

$$A = \{0, 1, 2\}; \quad B = \{2, 3, 4\}$$

- A)  $A \cup B = \{1, -1, 5, 4\}$
- B)  $A \cup B = \{0, 1, 2, 3, 4\}$
- C)  $A \cup B = \{0, 1, 2, 2, 3\}$
- D)  $A \cup B = \{2, 3, 4\}$
- E)  $A \cup B = \{0, 1, -1, 2\}$

174. Find  $A \cap B$ .

$$A = \{30, 31, 32\}; \quad B = \{32, 33, 34\}$$

- A)  $A \cap B = \{30, 31, 32, 33, 34\}$
- B)  $A \cap B = \{32\}$
- C)  $A \cap B = \{\emptyset\}$
- D)  $A \cap B = \{32, 33, 34\}$
- E)  $A \cap B = \emptyset$

175. Find  $A \cap B$ .

$$A = \{-14, -13, -12\}; \quad B = \{23, 24, 25\}$$

- A)  $A \cap B = \{-14, -13, -12, 23, 24, 25\}$
- B)  $A \cap B = \{23\}$
- C)  $A \cap B = \{\emptyset\}$
- D)  $A \cap B = \{23, 24, 25\}$
- E)  $A \cap B = \emptyset$

176. Use set-builder notation to write the set consisting of the negative integers greater than  $-23$ .
- A)  $\{x \mid x > -23, x \in \text{negative integers}\}$
  - B)  $\{x \mid x \geq -23, x \in \text{negative integers}\}$
  - C)  $\{x \mid x < -23, x \in \text{negative integers}\}$
  - D)  $\{x \mid x \leq -23, x \in \text{negative integers}\}$
  - E)  $\{x \mid x > 23, x \in \text{negative integers}\}$
177. Use set-builder notation to write the set consisting of the positive integers less than  $20$ .
- A)  $\{x \mid x > 20, x \in \text{positive integers}\}$
  - B)  $\{x \mid x \geq 20, x \in \text{positive integers}\}$
  - C)  $\{x \mid x < 20, x \in \text{positive integers}\}$
  - D)  $\{x \mid x \leq 20, x \in \text{positive integers}\}$
  - E)  $\{x \mid x > -20, x \in \text{positive integers}\}$
178. Use set-builder notation to write the set consisting of the integers greater than  $-18$ .
- A)  $\{x \mid x > -18, x \in \text{integers}\}$
  - B)  $\{x \mid x \geq -18, x \in \text{integers}\}$
  - C)  $\{x \mid x < -18, x \in \text{integers}\}$
  - D)  $\{x \mid x \leq -18, x \in \text{integers}\}$
  - E)  $\{x \mid x > 18, x \in \text{integers}\}$
179. Use set-builder notation to write the set consisting of the integers less than  $1$ .
- A)  $\{x \mid x > 1, x \in \text{integers}\}$
  - B)  $\{x \mid x \geq 1, x \in \text{integers}\}$
  - C)  $\{x \mid x < 1, x \in \text{integers}\}$
  - D)  $\{x \mid x \leq 1, x \in \text{integers}\}$
  - E)  $\{x \mid x > -1, x \in \text{integers}\}$

180. Use set-builder notation to write the set consisting of the numbers greater than  $-3$ .

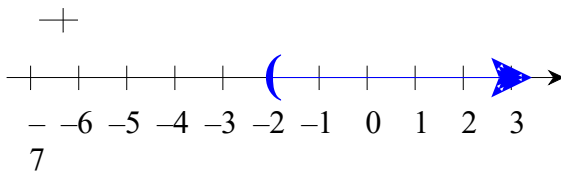
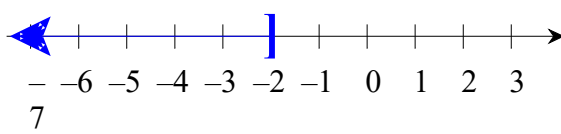
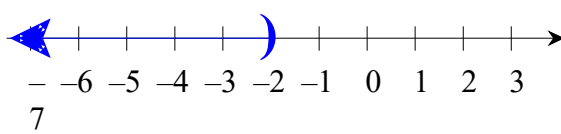
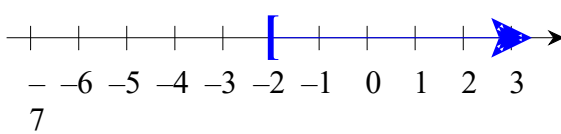
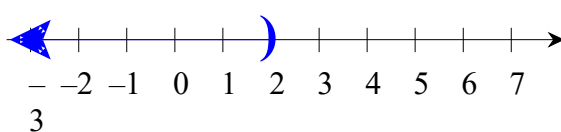
- A)  $\{x \mid x < -3, x \in \text{real numbers}\}$
- B)  $\{x \mid x \leq -3, x \in \text{real numbers}\}$
- C)  $\{x \mid x \geq -3, x \in \text{real numbers}\}$
- D)  $\{x \mid x > -3, x \in \text{real numbers}\}$
- E)  $\{x \mid x < -3, x \in \text{integers}\}$

181. Use set-builder notation to write the set consisting of the numbers less than  $-27$ .

- A)  $\{x \mid x \leq -27, x \in \text{real numbers}\}$
- B)  $\{x \mid x < -27, x \in \text{real numbers}\}$
- C)  $\{x \mid x \geq -27, x \in \text{real numbers}\}$
- D)  $\{x \mid x > -27, x \in \text{real numbers}\}$
- E)  $\{x \mid x < -27, x \in \text{integers}\}$

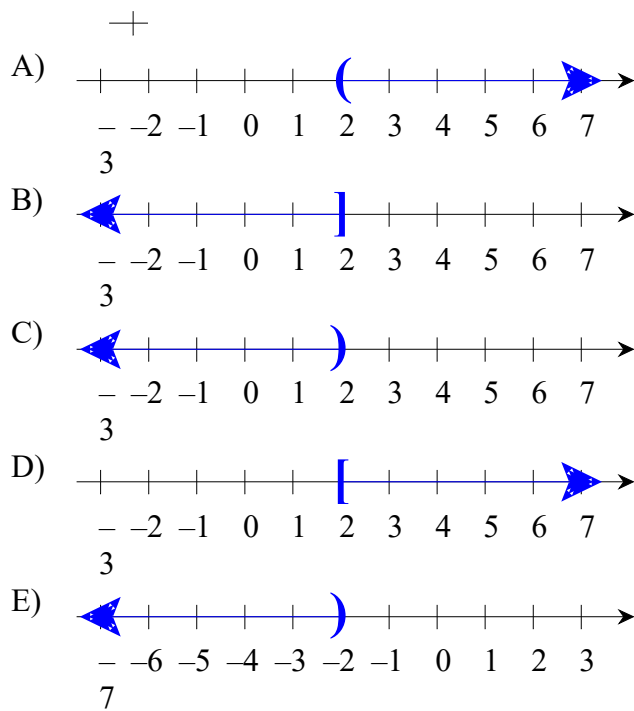
182. Graph:

$$\{x \mid x < -2\}$$

- A) 
- B) 
- C) 
- D) 
- E) 

183. Graph:

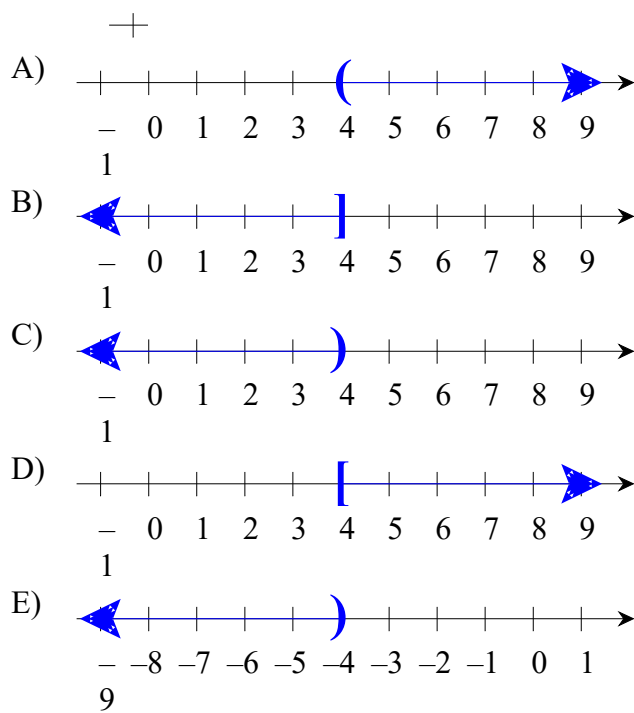
$$\{x \mid x \geq 2\}$$





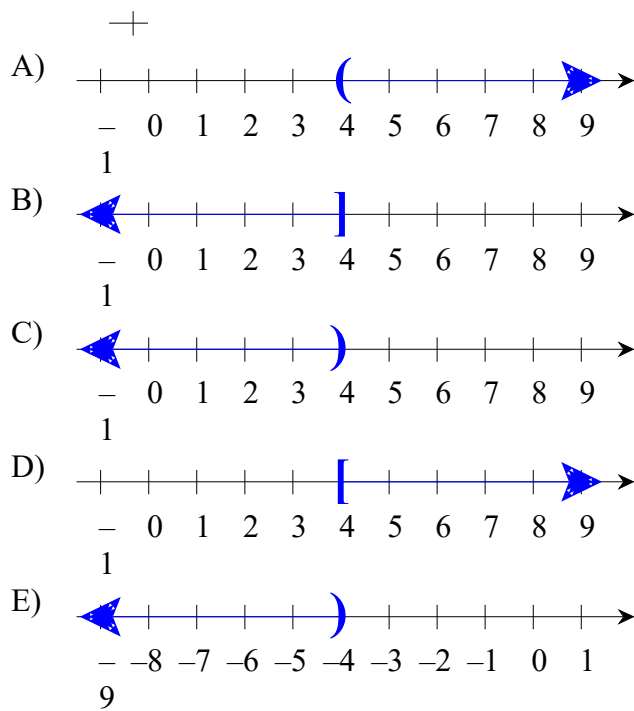
184. Graph:

$$\{x \mid x \leq 4\}$$



185. Graph:

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



## **Answer Key**

1. A
2. B
3. B
4. B
5. C
6. A
7. B
8. B
9. A
10. A
11. A
12. B
13. B
14. B
15. B
16. A
17. A
18. B
19. C
20. B
21. D
22. C
23. C
24. D
25. C
26. B
27. C
28. C
29. A
30. D
31. D
32. D
33. D
34. A
35. C
36. C
37. E
38. A
39. A
40. D
41. C
42. A
43. B
44. E

45. A
46. A
47. E
48. C
49. A
50. D
51. C
52. C
53. E
54. D
55. E
56. E
57. B
58. A
59. C
60. C
61. B
62. A
63. B
64. E
65. E
66. C
67. B
68. D
69. D
70. A
71. D
72. B
73. E
74. D
75. A
76. D
77. B
78. D
79. B
80. E
81. C
82. A
83. B
84. A
85. D
86. D
87. C
88. C
89. C
90. D

- 91. C
- 92. C
- 93. D
- 94. C
- 95. C
- 96. A
- 97. C
- 98. D
- 99. B
- 100. E
- 101. B
- 102. B
- 103. A
- 104. B
- 105. A
- 106. B
- 107. A
- 108. A
- 109. D
- 110. C
- 111. B
- 112. D
- 113. C
- 114. B
- 115. D
- 116. A
- 117. B
- 118. C
- 119. B
- 120. C
- 121. B
- 122. D
- 123. A
- 124. A
- 125. D
- 126. A
- 127. A
- 128. D
- 129. A
- 130. A
- 131. B
- 132. D
- 133. A
- 134. B
- 135. D
- 136. A

- 137. A
- 138. C
- 139. D
- 140. A
- 141. D
- 142. D
- 143. C
- 144. B
- 145. E
- 146. D
- 147. B
- 148. D
- 149. E
- 150. A
- 151. A
- 152. C
- 153. A
- 154. C
- 155. E
- 156. C
- 157. C
- 158. A
- 159. C
- 160. D
- 161. B
- 162. B
- 163. D
- 164. D
- 165. E
- 166. D
- 167. A
- 168. A
- 169. A
- 170. C
- 171. C
- 172. B
- 173. B
- 174. B
- 175. E
- 176. A
- 177. C
- 178. A
- 179. C
- 180. D
- 181. B
- 182. C

- 183. D
- 184. B
- 185. A