

**TEST BANK**

LIAL  
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SCHNEIDER

# Precalculus



4<sup>TH</sup> EDITION

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

**Decide whether the statement is true or false.**

1) -5 is a solution of  $-8x = 40$ . 1) \_\_\_\_\_  
A) True B) False  
Answer: A

2) -14 is a solution of  $-8x = 111$ . 2) \_\_\_\_\_  
A) True B) False  
Answer: B

3) 3 is a solution of  $7x - 5 = 16$ . 3) \_\_\_\_\_  
A) True B) False  
Answer: A

4) 1 is a solution of  $-8x + 4 = 0$ . 4) \_\_\_\_\_  
A) True B) False  
Answer: B

5) 8 is a solution of  $-2x + 4x = 16$ . 5) \_\_\_\_\_  
A) True B) False  
Answer: A

6) 5 is a solution of  $8x - 5x = 67$ . 6) \_\_\_\_\_  
A) True B) False  
Answer: B

7) 4 is a solution of  $7x + 8x = 14x$ . 7) \_\_\_\_\_  
A) True B) False  
Answer: B

**Decide whether or not the equations are equivalent.**

8)  $z^2 = 36$  8) \_\_\_\_\_  
 $z = 6$   
A) Equivalent B) Not equivalent  
Answer: B

9)  $x = -6$  9) \_\_\_\_\_  
 $x^2 = 36$   
A) Equivalent B) Not equivalent  
Answer: B

10)  $x = 2 - 4x$  10) \_\_\_\_\_  
 $3x = 2$   
A) Equivalent B) Not equivalent  
Answer: B

11)  $\frac{x+1}{5} = \frac{4}{5}$  11) \_\_\_\_\_  
 $x + 2 = 5$   
A) Equivalent B) Not equivalent

Answer: A

12)  $2x - 5 = 8$   
 $-2x + 8 = -5$   
A) Equivalent  
Answer: A

B) Not equivalent

12) \_\_\_\_\_

13)  $3x - 4 = 8$   
 $-3x - 4 = 8$   
A) Equivalent  
Answer: B

B) Not equivalent

13) \_\_\_\_\_

**Determine whether or not the equation is linear.**

14)  $6x + 7(x - 9) = 16x$   
A) Linear  
Answer: A

B) Not linear

14) \_\_\_\_\_

15)  $6x + 5x(x - 4) = 12x$   
A) Linear  
Answer: B

B) Not linear

15) \_\_\_\_\_

16)  $3x^2 + 7x + 2 = 0$   
A) Linear  
Answer: B

B) Not linear

16) \_\_\_\_\_

17)  $.04x - .07x = .40$   
A) Linear  
Answer: A

B) Not linear

17) \_\_\_\_\_

18)  $.02x^2 + .07x = .90$   
A) Linear  
Answer: B

B) Not linear

18) \_\_\_\_\_

19)  $3x = 5x - 9x$   
A) Linear  
Answer: A

B) Not linear

19) \_\_\_\_\_

20)  $7x + 6x = 0$   
A) Linear  
Answer: A

B) Not linear

20) \_\_\_\_\_

21)  $2x - 5 = 0$   
A) Linear  
Answer: A

B) Not linear

21) \_\_\_\_\_

**Solve the equation.**

22)  $-5x - 3 = x + 6$   
A)  $\left\{-\frac{1}{2}\right\}$   
Answer: B

B)  $\left\{-\frac{3}{2}\right\}$

C)  $\left\{-\frac{3}{5}\right\}$

D)  $\left\{-\frac{9}{5}\right\}$

22) \_\_\_\_\_

23)  $-7x - 7 + 6(x + 1) = -2x - 7$

23) \_\_\_\_\_

A)  $\left\{\frac{6}{7}\right\}$

B)  $\{-6\}$

C)  $\left\{\frac{20}{7}\right\}$

D)  $\{-20\}$

Answer: B

24)  $-3[-3x + 5] - 4(x + 1) = 3x + 6$

A)  $\{-3\}$

B)  $\left\{\frac{1}{2}\right\}$

C)  $\left\{-\frac{7}{6}\right\}$

D)  $\{7\}$

24) \_\_\_\_\_

Answer: B

25)  $\frac{x+2}{6} = \frac{x-3}{8}$

A)  $\{-17\}$

B)  $\{-10\}$

C)  $\{-1\}$

D)  $\left\{-\frac{17}{7}\right\}$

25) \_\_\_\_\_

Answer: A

26)  $1 - \frac{9}{2x} = \frac{8}{6}$

A)  $\{27\}$

B)  $\left\{-\frac{27}{2}\right\}$

C)  $\left\{\frac{27}{2}\right\}$

D)  $\left\{-\frac{54}{7}\right\}$

26) \_\_\_\_\_

Answer: B

27)  $2x + 7 - 5(x + 1) = -(-4x - 7)$

A)  $\left\{\frac{5}{2}\right\}$

B)  $\left\{\frac{9}{7}\right\}$

C)  $\left\{-\frac{9}{2}\right\}$

D)  $\left\{-\frac{5}{7}\right\}$

27) \_\_\_\_\_

Answer: D

28)  $-5[2x - 1] - 5(x + 1) = -6x + 4$

A)  $\left\{-\frac{26}{21}\right\}$

B)  $\{-8\}$

C)  $\{-13\}$

D)  $\left\{-\frac{16}{21}\right\}$

28) \_\_\_\_\_

Answer: A

29)  $\frac{5x}{7} - 8 = x$

A)  $\{-28\}$

B)  $\{56\}$

C)  $\{28\}$

D)  $\{112\}$

29) \_\_\_\_\_

Answer: A

30)  $\frac{x-5}{9} = \frac{x+2}{7}$

A)  $\left\{-\frac{53}{2}\right\}$

B)  $\left\{\frac{17}{2}\right\}$

C)  $\left\{\frac{53}{16}\right\}$

D)  $\left\{-\frac{23}{2}\right\}$

30) \_\_\_\_\_

Answer: A

31)  $-10.8x + 1.6 = -100.7 - 1.5x$

A)  $\{9.5\}$

B)  $\{9.6\}$

C)  $\{11\}$

D)  $\{-112\}$

31) \_\_\_\_\_

Answer: C

**Decide whether the equation is an identity, a conditional equation, or a contradiction. Give the solution set.**

32)  $35x + 15 = 5(4x - 3)$

A) Conditional;  $\{-0\}$

B) Conditional;  $\{-2\}$

C) Identity;  $\{\text{all real numbers}\}$

D) Contradiction;  $\emptyset$

32) \_\_\_\_\_

Answer: B

- 33)  $2(12x + 4) = 4(2x + 18)$   
A) Identity; {all real numbers}  
C) Conditional; {4}

Answer: C

- B) Conditional; {-5}  
D) Contradiction;  $\emptyset$

33) \_\_\_\_\_

- 34)  $5(2x - 31) = 10x - 155$   
A) Conditional; {0}  
C) Identity; {all real numbers}

Answer: C

- B) Identity;  $\emptyset$   
D) Contradiction;  $\emptyset$

34) \_\_\_\_\_

- 35)  $8(x + 4) + (-17x) = -9(x + 3) + 17$   
A) Identity; {all real numbers}  
C) Conditional; {0}

Answer: D

- B) Conditional; {12}  
D) Contradiction;  $\emptyset$

35) \_\_\_\_\_

- 36)  $18(x - 3) = 6(3x - 2) - 42$   
A) Conditional; {0}  
C) Contradiction;  $\emptyset$

Answer: B

- B) Identity; {all real numbers}  
D) Conditional; {-54}

36) \_\_\_\_\_

- 37)  $3(3x + 16) - 9x - 48 = 0$   
A) Conditional; {0}  
C) Identity; {all real numbers}

Answer: C

- B) Contradiction;  $\emptyset$   
D) Conditional; {3}

37) \_\_\_\_\_

- 38)  $8x - 3 = 2(4x - 6)$   
A) Conditional; {4}  
C) Conditional; {-4}

Answer: D

- B) Identity; {all real numbers}  
D) Contradiction;  $\emptyset$

38) \_\_\_\_\_

- 39)  $-12x - 22 + 4(3x + 7) = 0$   
A) Identity; {all real numbers}  
C) Contradiction;  $\emptyset$

Answer: C

- B) Conditional; {1}  
D) Conditional; {3}

39) \_\_\_\_\_

- 40)  $2x + 9(x + 1) + 4 = 13 - 4x$   
A) Identity; {all real numbers}  
C) Conditional; {1}

Answer: B

- B) Conditional; {0}  
D) Contradiction;  $\emptyset$

40) \_\_\_\_\_

- 41)  $2[3 - (6 - 5x)] - x = -12 + 3(2 + 3x)$   
A) Conditional; {-6}  
C) Contradiction;  $\emptyset$

Answer: D

- B) Conditional; {12}  
D) Identity; {all real numbers}

41) \_\_\_\_\_

**Solve the formula for the indicated variable.**

- 42)  $A = bh$ , for  $b$

A)  $\frac{h}{A}$   
 $b = \frac{A}{h}$

B)  $b = Ab$

C)  $\frac{A}{h}$   
 $b = \frac{A}{h}$

D)  $b = A - b$

Answer: C

42) \_\_\_\_\_

43)  $I = Prt$ , for  $r$  43) \_\_\_\_\_

A)  $r = \frac{P-1}{It}$       B)  $r = \frac{I}{Pt}$       C)  $r = \frac{P-I}{1+t}$       D)  $r = P - It$

Answer: B

44)  $S = 2\pi rh + 2\pi r^2$ , for  $h$  44) \_\_\_\_\_

A)  $h = \frac{S}{2\pi r} - 1$       B)  $h = 2\pi(S - r)$       C)  $h = S - r$       D)  $h = \frac{S - 2\pi r^2}{2\pi r}$

Answer: D

45)  $V = \frac{1}{3}Bh$ , for  $h$  45) \_\_\_\_\_

A)  $h = \frac{B}{3V}$       B)  $h = \frac{3B}{V}$       C)  $h = \frac{V}{3B}$       D)  $h = \frac{3V}{B}$

Answer: D

46)  $P = s_1 + s_2 + s_3$ , for  $s_2$  46) \_\_\_\_\_

A)  $s_2 = P - s_1 - s_3$       B)  $s_2 = P + s_1 + s_3$       C)  $s_2 = s_1 + P - s_3$       D)  $s_2 = s_1 + s_3 - P$

Answer: A

47)  $F = \frac{9}{5}C + 32$ , for  $C$  47) \_\_\_\_\_

A)  $C = \frac{5}{F-32}$       B)  $C = \frac{9}{5}(F-32)$       C)  $C = \frac{5}{9}(F-32)$       D)  $C = \frac{F-32}{9}$

Answer: C

48)  $P = 2l + 2w$ , for  $w$  48) \_\_\_\_\_

A)  $w = \frac{P}{2} - 2l$       B)  $w = \frac{P-2l}{2}$       C)  $w = \frac{P}{2l+2}$       D)  $w = P - 2l - 2$

Answer: B

49)  $R = nE - nr$ , for  $n$  49) \_\_\_\_\_

A)  $n = \frac{R+nr}{E}$       B)  $n = \frac{R}{E-r}$       C)  $n = R - E + r$       D)  $n = R + nr - E$

Answer: B

50)  $A = P(1 + nr)$ , for  $n$  50) \_\_\_\_\_

A)  $n = \frac{A-P}{Pr}$       B)  $n = \frac{A}{r}$       C)  $n = \frac{Pr}{A-P}$       D)  $n = \frac{P-A}{Pr}$

Answer: A

51)  $I = \frac{nE}{nr+R}$ , for  $n$  51) \_\_\_\_\_

A)  $n = \frac{IR}{Ir+E}$       B)  $n = IR(Ir - E)$       C)  $n = \frac{R}{E-Ir}$       D)  $n = \frac{IR}{E-Ir}$

Answer: D

Solve for y.

52)  $3x + 5y = 4$

A)  $y = \frac{9}{3x}$

Answer: D

B)  $y = 3 + 3x$

C)  $y = 9 - 3x$

D)  $y = \frac{4-3x}{5}$

52) \_\_\_\_\_

53)  $4x - 7y = 4$

A)  $y = \frac{4x-4}{7}$

Answer: A

B)  $y = 4x - 11$

C)  $y = \frac{4x+4}{7}$

D)  $y = 4x + 11$

53) \_\_\_\_\_

54)  $3x = 8y - 5$

A)  $y = \frac{3x-5}{8}$

Answer: B

B)  $y = \frac{3x+5}{8}$

C)  $y = 13 - 3x$

D)  $y = 13 + 3x$

54) \_\_\_\_\_

55)  $3 = 4x - 3y$

A)  $y = 6 - 4x$

Answer: C

B)  $y = \frac{4x+3}{3}$

C)  $y = \frac{4x-3}{3}$

D)  $y = 6 + 4x$

55) \_\_\_\_\_

56)  $y - 10(x + 4) = 10 + 2y$

A)  $y = 10x + 50$

Answer: C

B)  $y = -10x + 50$

C)  $y = -10x - 50$

D)  $y = 10x + 30$

56) \_\_\_\_\_

57)  $6x - 10(x + y) = y - x$

A)  $y = -3x + 11$

Answer: D

B)  $y = -3x$

C)  $y = -3x - 11$

D)  $y = -\frac{3}{11}x$

57) \_\_\_\_\_

58)  $9y + x^2 = x + 10$

A)  $y = \frac{x+10-x^2}{9}$

Answer: A

B)  $y = x + 10 - x^2$

C)  $y = x^2 - x - 10$

D)  $y = \frac{x^2-x-10}{9}$

58) \_\_\_\_\_

59)  $8x^2 - y + 2x = 0$

A)  $y = 8x^2 + 2x$

Answer: A

B)  $y = -8x^2 - 2x$

C)  $y = 8x^2 - 2x$

D)  $y = -8x^2 + 2x$

59) \_\_\_\_\_

60)  $5x + 10 = 2y - 4$

A)  $y = \frac{5x+14}{2}$

Answer: A

B)  $y = 5x - 14$

C)  $y = \frac{5x-14}{2}$

D)  $y = 5x + 14$

60) \_\_\_\_\_

Use these equations to convert between the two systems.

$C = \frac{5}{9}(F - 32)$        $F = \frac{9}{5}C + 32$

Round answer to the nearest tenth of a degree if necessary.

61)  $F = 216^\circ$

61) \_\_\_\_\_

- A)  $C = 102.2^\circ$       B)  $C = 331.2^\circ$       C)  $C = 420.8^\circ$       D)  $C = 116.4^\circ$   
 Answer: A

- 62)  $C = 21^\circ$       62) \_\_\_\_\_  
 A)  $F = -6.1^\circ$       B)  $F = 69.8^\circ$       C)  $F = 95.4^\circ$       D)  $F = 29.4^\circ$   
 Answer: B

- 63)  $F = 26^\circ$       63) \_\_\_\_\_  
 A)  $C = -10.8^\circ$       B)  $C = 32.2^\circ$       C)  $C = -3.3^\circ$       D)  $C = 10.9^\circ$   
 Answer: C

- 64)  $C = 15^\circ$       64) \_\_\_\_\_  
 A)  $F = 84.6^\circ$       B)  $F = -9.4^\circ$       C)  $F = 59^\circ$       D)  $F = 26.1^\circ$   
 Answer: C

**Solve the problem.**

- 65) Find the corresponding Celsius temperature for a temperature of  $226^\circ\text{F}$ . Round to the nearest tenth, if necessary.      65) \_\_\_\_\_  
 A)  $349.2^\circ\text{C}$       B)  $438.8^\circ\text{C}$       C)  $107.8^\circ\text{C}$       D)  $122^\circ\text{C}$   
 Answer: C

- 66) Find the corresponding Fahrenheit temperature for a temperature of  $58^\circ\text{C}$ . Round to the nearest tenth, if necessary.      66) \_\_\_\_\_  
 A)  $50^\circ\text{F}$       B)  $14.4^\circ\text{F}$       C)  $136.4^\circ\text{F}$       D)  $162^\circ\text{F}$   
 Answer: C

- 67) Levi borrowed \$ 4642 at 7% simple interest for 11 months. How much will the interest amount to? What is the total amount that Levi will have to pay back at the end of 11 months? Round answers to the nearest cent if necessary.      67) \_\_\_\_\_  
 A) \$ 324.94; \$ 4966.94      B) \$ 270.78; \$ 4912.78  
 C) \$ 297.86; \$ 4939.86      D) \$ 300.36; \$ 4942.36  
 Answer: C

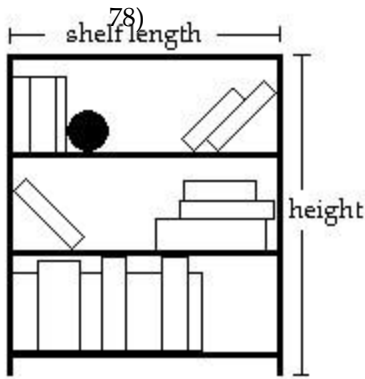
- 68) Sophia borrowed \$ 12,369 at 13.2% simple interest for 4 months. How much will the interest amount to? What is the total amount that she will have to pay back at the end of 4 months? Round answers to the nearest cent if necessary.      68) \_\_\_\_\_  
 A) \$ 408.18; \$ 12,777.18      B) \$ 544.24; \$ 12,913.24  
 C) \$ 548.81; \$ 12,917.81      D) \$ 680.29; \$ 13,049.30  
 Answer: B

- 69) Hannah borrowed \$ 49,823 at 8.2% simple interest for 18 months. How much will the interest amount to? What is the total amount that she will have to pay back at the end of 18 months? Round answers to the nearest cent if necessary.      69) \_\_\_\_\_  
 A) \$ 6468.69; \$ 56,291.69      B) \$ 5787.77; \$ 55,610.77  
 C) \$ 6128.23; \$ 55,951.23      D) \$ 6179.73; \$ 56,002.73  
 Answer: C

- 70) Find the length of a rectangular lot with a perimeter of 134 m if the length is 7 m more than the width.      70) \_\_\_\_\_  
 A) 74 m      B) 67 m      C) 30 m      D) 37 m  
 Answer: D



- 71) A square plywood platform has a perimeter which is 7 times the length of a side, decreased by 12. Find the length of a side. 71) \_\_\_\_\_  
 A) 7                                      B) 1                                      C) 4                                      D) 3  
 Answer: C
- 72) A rectangular Persian carpet has a perimeter of 184 inches. The length of the carpet is 18 in. more than the width. What are the dimensions of the carpet? 72) \_\_\_\_\_  
 A) Width: 74 in.; length: 92 in.                                      B) Width: 55 in.; length: 73 in.  
 C) Width: 83 in.; length: 101 in.                                      D) Width: 37 in.; length: 55 in.  
 Answer: D
- 73) A triangular shaped lake-front lot has a perimeter of 1500 ft. One side is 100 ft longer than the shortest side, while the third side is 500 ft longer than the shortest side. Find the lengths of all three sides. 73) \_\_\_\_\_  
 A) 300 ft, 400 ft, 800 ft                                      B) 100 ft, 200 ft, 300 ft  
 C) 400 ft, 400 ft, 400 ft                                      D) 400 ft, 500 ft, 900 ft  
 Answer: A
- 74) In triangle  $ABC$ , the angle  $C$  is six times as large as angle  $A$ . The measure of angle  $B$  is  $52^\circ$  greater than that of angle  $A$ . Find the measure of the angles. 74) \_\_\_\_\_  
 A)  $16^\circ$ ,  $84^\circ$  and  $96^\circ$                                       B)  $16^\circ$ ,  $68^\circ$  and  $112^\circ$   
 C)  $16^\circ$ ,  $68^\circ$  and  $96^\circ$                                       D)  $16^\circ$ ,  $84^\circ$  and  $80^\circ$   
 Answer: C
- 75) In triangle  $ABC$ , angle  $A$  is three times as large as angle  $C$ . The measure of angle  $B$  is  $30^\circ$  less than that of angle  $C$ . Find the measure of the angles. 75) \_\_\_\_\_  
 A)  $84^\circ$ ,  $12^\circ$  and  $84^\circ$                                       B)  $126^\circ$ ,  $12^\circ$  and  $84^\circ$   
 C)  $84^\circ$ ,  $12^\circ$  and  $42^\circ$                                       D)  $126^\circ$ ,  $12^\circ$  and  $42^\circ$   
 Answer: D
- 76) A cylindrical container has a volume of  $475\pi \text{ yd}^3$  and a radius of 5 yd. Find the height of the container. 76) \_\_\_\_\_  
 A) 5 yd                                      B) 4 yd                                      C) 22 yd                                      D) 19 yd  
 Answer: D
- 77) A circular hole is filled with concrete to make a footing for a load-bearing pier. The hole measures 16 inches across and requires 2.1 bags of concrete in order to fill it to ground level. What is the depth of the hole? Round your answer to the nearest inch. (One bag of concrete, when mixed with the appropriate amount of water, makes  $1800 \text{ in.}^3$  of material.) 77) \_\_\_\_\_  
 A) 19 in.                                      B) 25 in.                                      C) 16 in.                                      D) 23 in.  
 Answer: A
- 78) A bookcase is to be constructed as shown in the figure below. The height of the bookcase is 2 feet longer than the length of a shelf. If 22 feet of lumber is available for the entire unit (including the shelves, but NOT the back of the bookcase), find the length and height of the unit.



- 78) \_\_\_\_\_  
 \_\_\_\_\_
- A) length = 3 ft; height = 5 ft  
 B) length = 10.0 ft; height = 13.5 ft  
 C) length = 3 ft; height = 6 ft  
 D) length = 4.5 ft; height = 6.5 ft
- Answer: A

79) Find the height of a moving box if its length is 33 in., its width is 29 in., and its surface area is  $3774\text{in}^2$ . Assume that the surface area includes the top of the moving box. 79) \_\_\_\_\_

- A) 14,355 in.      B) 33 in.      C) 29 in.      D) 15 in.
- Answer: D

80) Chuck and Dana agree to meet in Chicago for the weekend. Chuck travels 240 miles in the same time that Dana travels 220 miles. If Chuck's rate of travel is 4 mph more than Dana's, and they travel the same length of time, at what speed does Chuck travel? 80) \_\_\_\_\_

- A) 50 mph      B) 44 mph      C) 48 mph      D) 46 mph
- Answer: C

81) In the morning, May drove to an appointment at 50 mph. Her average speed on the return trip in the afternoon was 40 mph. The return trip took  $\frac{1}{5}$  hour longer. How far did she travel to the appointment? 81) \_\_\_\_\_

- A) 32 mi      B) 12 mi      C) 40 mi      D) 0.8 mi
- Answer: C

82) Noah and Ben are running in the Walker Street Fun Run. Noah runs at 7 mph, Ben at 5 mph. If they start at the same time, how long (in minutes) will it be before they are  $\frac{1}{3}$  mile apart? 82) \_\_\_\_\_

- A) 40 minutes      B) 10 minutes      C) 90 minutes      D) 6 minutes
- Answer: B

83) Jill is 22.5 kilometers away from Joe. Both begin to walk toward each other at the same time. Jill walks at 1.5 kilometers per hour. They meet in 5 hours. How fast is Joe walking? 83) \_\_\_\_\_

- A) 1.5 km/hr      B) 4 km/hr      C) 3 km/hr      D) 5 km/hr
- Answer: C

84) Candy and Delvis are riding bicycles in the same direction. Candy is traveling at a speed of 5 miles per hour, and Delvis is traveling at a speed of 14 miles per hour. In 2 hours what is the distance between them (assuming that they began at the same point and time)? 84) \_\_\_\_\_

- A) 18 mi      B) 19 mi      C) 27 mi      D) 15 mi
- Answer: A

- 85) From a point on a river, two boats are driven in opposite directions, one at 6 miles per hour and the other at 5 miles per hour. In how many hours will they be 33 miles apart? 85) \_\_\_\_\_  
A) 3 hr                                      B) 5 hr                                      C) 4 hr                                      D) 1 hr  
Answer: A
- 86) Tom Quig traveled 240 miles east of St. Louis. For most of the trip he averaged 70 mph, but for one period of time he was slowed to 10 mph due to a major accident. If the total time of travel was 6 hours, how many miles did he drive at the reduced speed? 86) \_\_\_\_\_  
A) 25 mi                                      B) 50 mi                                      C) 30 mi                                      D) 40 mi  
Answer: C
- 87) On a recent trip, Sarah's car traveled 20 mph faster on the first 180 miles than it did on the remaining 80 miles. The total time for the trip was 4 hr. Find the speed of Sarah's car on the first part of the trip. 87) \_\_\_\_\_  
A) 12 mph                                      B) 60 mph                                      C) 53 mph                                      D) 73 mph  
Answer: D
- 88) An airplane leaves Los Angeles for Denver at a speed of 400 mph. Thirty minutes later, a plane going from Denver to Los Angeles leaves Denver, which is 850 miles from Los Angeles, at a speed of 460 mph. When they meet, how far are they from Denver? 88) \_\_\_\_\_  
A) 116 mi                                      B) 289 mi                                      C) 348 mi                                      D) 58 mi  
Answer: C
- 89) An airplane flies from Metro City to Gotham with a tailwind that increases its normal speed by 100 mph. On the return trip, the plane must fly against this wind, which decreases its normal speed by the same amount. The flight from Metro City takes 3.50 hours and the return trip takes 7.00 hours. How far is it from Metro City to Gotham? 89) \_\_\_\_\_  
A) 1700 mi                                      B) 1400 mi                                      C) 1600 mi                                      D) 1520 mi  
Answer: B
- 90) How many liters of a 30% alcohol solution must be mixed with 80 liters of a 90% solution to get a 40% solution? 90) \_\_\_\_\_  
A) 400 L                                      B) 40 L                                      C) 48 L                                      D) 480 L  
Answer: A
- 91) In a chemistry class, 3 liters of a 4% silver iodide solution must be mixed with a 10% solution to get a 6% solution. How many liters of the 10% solution are needed? 91) \_\_\_\_\_  
A) 2.5 L                                      B) 0.5 L                                      C) 3 L                                      D) 1.5 L  
Answer: D
- 92) It is necessary to have a 40% antifreeze solution in the radiator of a certain car. The radiator now has 60 liters of 20% solution. How many liters of this should be drained and replaced with 100% antifreeze to get the desired strength? 92) \_\_\_\_\_  
A) 24 L                                      B) 15 L                                      C) 30 L                                      D) 20.0 L  
Answer: B
- 93) How much pure acid should be mixed with 4 gallons of a 50% acid solution in order to get an 80% acid solution? 93) \_\_\_\_\_  
A) 2 gal                                      B) 6 gal                                      C) 10 gal                                      D) 16 gal  
Answer: B
- 94) A chemist needs 140 milliliters of a 57% solution but has only 41% and 97% solutions available.

Find 94)  
how  
many  
milliliters  
of each  
that  
should  
be mixed  
to get the  
desired  
solution.

- A) 30 mL of 41%; 110 mL of 97%                      B) 40 mL of 41%; 100 mL of 97%  
C) 100 mL of 41%; 40 mL of 97%                      D) 110 mL of 41%; 30 mL of 97%

Answer: C

95) Mardi received an inheritance of \$ 50,000. She invested part at 9% and deposited the remainder in tax-free bonds at 10%. Her total annual income from the investments was \$4600. Find the amount invested at 9%. 95) \_\_\_\_\_

- A) \$ 39,000                      B) \$ 45,400                      C) \$ 40,000                      D) \$ 20,000

Answer: C

96) Walt made an extra \$ 7000 last year from a part-time job. He invested part of the money at 6% and the rest at 8%. He made a total of \$500 in interest. How much was invested at 8%? 96) \_\_\_\_\_

- A) \$ 4000                      B) \$ 3000                      C) \$ 3500                      D) \$ 5000

Answer: A

97) Roberto invested some money at 8%, and then invested \$3000 more than twice this amount at 12%. His total annual income from the two investments was \$3560. How much was invested at 12%? 97) \_\_\_\_\_

- A) \$ 20,000                      B) \$ 2300                      C) \$ 23,000                      D) \$ 9000

Answer: C

98) Helen Weller invested \$ 11,000 in an account that pays 12% simple interest. How much additional money must be invested in an account that pays 15% simple interest so that the average return on the two investments amounts to 13%? 98) \_\_\_\_\_

- A) \$ 11,000                      B) \$ 8000                      C) \$ 7000                      D) \$ 5500

Answer: D

99) Don James wants to invest \$59,000 to earn \$5620 per year. He can invest in B-rated bonds paying 11% per year or in a Certificate of Deposit (CD) paying 8% per year. How much money should be invested in each to realize exactly \$5620 in interest per year? 99) \_\_\_\_\_

- A) \$30,000 in B-rated bonds and \$29,000 in a CD  
B) \$28,000 in B-rated bonds and \$31,000 in a CD  
C) \$31,000 in B-rated bonds and \$28,000 in a CD  
D) \$29,000 in B-rated bonds and \$30,000 in a CD

Answer: A

100) A bank loaned out \$68,000, part of it at the rate of 11% per year and the rest at a rate of 5% per year. If the interest received was \$4960, how much was loaned at 11%? 100) \_\_\_\_\_

- A) \$41,000                      B) \$26,000                      C) \$42,000                      D) \$27,000

Answer: B

- 101) Kevin invested part of his \$10,000 bonus in a certificate of deposit that paid 6% annual simple interest, and the remainder in a mutual fund that paid 11% annual simple interest. If his total interest for that year was \$900, how much did Kevin invest in the mutual fund? 101) \_\_\_\_\_
- A) \$6000                      B) \$5000                      C) \$4000                      D) \$7000

Answer: A

- 102) A person's emotional quotient (EQ) is found by multiplying emotional age by 100 and dividing by chronological age. Using this information, if a 13 yr old person has an EQ of 91 what is that person's emotional age? 102) \_\_\_\_\_
- A) 20.8 years old              B) 13 years old              C) 14.29 years old              D) 11.83 years old

Answer: D

- 103) A toy company uses the linear model  $y = -4x + 378$  to predict the decline in sales of a toy after it has been on the market more than one year. If  $x$  is the number of months after the first year and  $y$  is the number of toys sold in hundreds during that month, how many toys will be sold 8 months after the first year? 103) \_\_\_\_\_
- A) 41,000 toys              B) 34,600 toys              C) -150,400 toys              D) -9250 toys

Answer: B

- 104) A computer company uses the linear model  $y = -46x + 21,332$  to predict the decline in sales of a computer after it has been on the market more than one year. If  $x$  is the number of months after the first year and  $y$  is the number of computers sold during that month, how many computers will be sold 5 months after the first year? 104) \_\_\_\_\_
- A) 21,102 computers                      B) 464 computers  
C) 21,562 computers                      D) 20,550 computers

Answer: A

- 105) Your home state uses a linear model  $y = 27(x - 70) + 4178$  to predict the number of vacationers ( $y$ ) as compared to the average temperature for that week ( $x$ ). Find the number of vacationers predicted for a week with an average temperature of 68 degrees. 105) \_\_\_\_\_
- A) 5944 vacationers                      B) 7904 vacationers  
C) 112,752 vacationers                      D) 4124 vacationers

Answer: D

**Identify the number as real, complex, pure imaginary, or nonreal complex. More than one of these descriptions may apply.**

- 106)  $-9 - i$  106) \_\_\_\_\_
- A) Complex, pure imaginary, nonreal complex  
B) Complex  
C) Nonreal complex  
D) Real, complex

Answer: C

- 107)  $2 + 3i$  107) \_\_\_\_\_
- A) Real, complex  
B) Nonreal complex  
C) Complex  
D) Complex, pure imaginary, nonreal complex

Answer: B

- 108) 13 108) \_\_\_\_\_
- A) Nonreal complex

- B) Real, complex
- C) Complex, pure imaginary, nonreal complex
- D) Complex

Answer: B

109) -4

- A) Complex
- B) Real, complex
- C) Complex, pure imaginary, nonreal complex
- D) Nonreal complex

Answer: B

109) \_\_\_\_\_

110) 0

- A) Complex, pure imaginary, nonreal complex
- B) Nonreal complex
- C) Complex
- D) Real, complex

Answer: D

110) \_\_\_\_\_

111)  $\pi$

- A) Complex, pure imaginary, nonreal complex
- B) Complex
- C) Nonreal complex
- D) Real, complex

Answer: D

111) \_\_\_\_\_

112)  $\sqrt{1}$

- A) Complex, pure imaginary, nonreal complex
- B) Complex
- C) Real, complex
- D) Nonreal complex

Answer: C

112) \_\_\_\_\_

113)  $\sqrt{-14}$

- A) Complex
- B) Real, complex
- C) Complex, pure imaginary, nonreal complex
- D) Nonreal complex

Answer: C

113) \_\_\_\_\_

**Write the number as the product of a real number and i.**

114)  $\sqrt{-144}$

- A) 12i
- B)  $12\sqrt{i}$
- C) -12i
- D)  $-i\sqrt{144}$

Answer: A

114) \_\_\_\_\_

115)  $\sqrt{-100}$

- A)  $i\sqrt{100}$
- B) -10i
- C) 10
- D) 10i

Answer: B

115) \_\_\_\_\_

116)  $\sqrt{-43}$

- A)  $-i\sqrt{43}$
- B)  $i\sqrt{43}$
- C)  $\sqrt{43i}$
- D)  $i\sqrt{-43}$

116) \_\_\_\_\_

Answer: B

117)  $\sqrt{-171}$  117) \_\_\_\_\_  
A)  $-3i\sqrt{19}$  B)  $-3\sqrt{19i}$  C)  $3\sqrt{19i}$  D)  $3i\sqrt{19}$

Answer: D

**Multiply or divide, as indicated. Simplify the answer.**

118)  $\sqrt{-11} \cdot \sqrt{-11}$  118) \_\_\_\_\_  
A) -11 B) -11i C) 11i D) 11

Answer: A

119)  $\frac{\sqrt{-112}}{\sqrt{-7}}$  119) \_\_\_\_\_  
A) -4i B) -4 C) 4 D) 4i

Answer: C

120)  $\frac{\sqrt{-28}}{\sqrt{7}}$  120) \_\_\_\_\_  
A) 2i B) -2 C) 2 D) -2i

Answer: A

121)  $\frac{\sqrt{-10}}{\sqrt{-160}}$  121) \_\_\_\_\_  
A)  $\frac{1}{4}$  B)  $\frac{1}{4}$  C)  $\frac{1}{4i}$  D)  $\frac{1}{4i}$

Answer: A

122)  $\frac{\sqrt{-3}}{\sqrt{12}}$  122) \_\_\_\_\_  
A)  $\frac{1}{2}$  B)  $\frac{1}{2i}$  C)  $\frac{1}{2i}$  D)  $\frac{1}{2}$

Answer: B

123)  $\frac{\sqrt{-6} \cdot \sqrt{-3}}{\sqrt{2}}$  123) \_\_\_\_\_  
A) 3 B) -3 C) 3i D) -3i

Answer: B

**Write the number in standard form a + bi.**

124)  $\frac{2 + \sqrt{-28}}{2}$  124) \_\_\_\_\_

A)  $1 - i\sqrt{14}$  B)  $1 + 2i\sqrt{7}$  C)  $1 + i\sqrt{14}$  D)  $1 + i\sqrt{7}$

Answer: D

125)  $\frac{4 + \sqrt{-48}}{2}$  125) \_\_\_\_\_

A)  $2 - 4i\sqrt{3}$  B)  $2 + 2i\sqrt{6}$  C)  $2 + 2i\sqrt{3}$  D)  $2 - 4i\sqrt{6}$

Answer: C

126)  $\frac{-2 + \sqrt{-12}}{6}$

A)  $\frac{1}{3} + \frac{3\sqrt{2}}{3}i$

B)  $\frac{1}{3} + \frac{\sqrt{3}}{6}i$

C)  $\frac{1}{3} + \frac{2\sqrt{3}}{3}i$

D)  $\frac{1}{3} + \frac{\sqrt{3}}{3}i$

Answer: D

126) \_\_\_\_\_

**Find the sum or difference. Write the answer in standard form.**

127)  $(5 - 8i) + (8 + 3i)$

A)  $-3 + 11i$

B)  $13 - 5i$

C)  $13 + 5i$

D)  $-13 + 5i$

Answer: B

127) \_\_\_\_\_

128)  $7i + (-4 - i)$

A)  $4 - 8i$

B)  $-4 + 8i$

C)  $4 - 6i$

D)  $-4 + 6i$

Answer: D

128) \_\_\_\_\_

129)  $(9 + 8i) - (-2 + i)$

A)  $11 + 7i$

B)  $-11 - 7i$

C)  $7 + 9i$

D)  $11 - 7i$

Answer: A

129) \_\_\_\_\_

130)  $(-4 + 7i) - 3$

A)  $-1 - 7i$

B)  $-1 + 7i$

C)  $7 - 7i$

D)  $-7 + 7i$

Answer: D

130) \_\_\_\_\_

131)  $(4 + 3i) + (5 + 8i) + 2i$

A)  $11 + 13i$

B)  $9 + 13i$

C)  $-1 + 11i$

D)  $9 - 13i$

Answer: B

131) \_\_\_\_\_

132)  $8i + (-6 - i)$

A)  $6 - 7i$

B)  $-6 + 7i$

C)  $-6 + 9i$

D)  $6 - 9i$

Answer: B

132) \_\_\_\_\_

133)  $(-4 + 3i) - (-9 - 4i) - (-8 - 4i)$

A)  $13 - 5i$

B)  $-3 + 3i$

C)  $13 + 11i$

D)  $-21 - 5i$

Answer: C

133) \_\_\_\_\_

134)  $(1 - 2i) - (-5 + 9i) + (2 - 3i)$

A)  $8 - 14i$

B)  $-8 - 8i$

C)  $-2 + 4i$

D)  $8 + 4i$

Answer: A

134) \_\_\_\_\_

**Find the product. Write the answer in standard form.**

135)  $5i(5 - 7i)$

A)  $25i + 35i^2$

B)  $-25i - 35i^2$

C)  $25i - 35$

D)  $35 + 25i$

Answer: D

135) \_\_\_\_\_

136)  $(9 - 2i)(5 + 3i)$

A)  $51 - 17i$

B)  $39 - 37i$

C)  $51 + 17i$

D)  $-6i^2 + 17i - 45$

Answer: C

136) \_\_\_\_\_

137)  $(4 - 2i)(5 - 2i)$

137) \_\_\_\_\_



A)  $16 + 18i$

B)  $4i^2 - 18i + 20$

C)  $24 - 2i$

D)  $16 - 18i$

Answer: D

138)  $(7 + 3i)^2$

A)  $40 - 42i$

B)  $40 + 42i$

C)  $58 - 42i$

D)  $58 + 42i$

138) \_\_\_\_\_

Answer: B

139)  $i(3 - 5i)(6 - 3i)$

A)  $39 + 3i$

B)  $15i^3 + 39i^2 + 18i$

C)  $33 - 21i$

D)  $-39 - 3i$

139) \_\_\_\_\_

Answer: A

140)  $(-3 - 2i)(-3 + 2i)$

A)  $9 - 4i^2$

B)  $9 + 4i^2$

C) 5

D) 13

140) \_\_\_\_\_

Answer: D

141)  $(-2 - 2i)^3$

A)  $16 - 73i$

C)  $16 - 16i$

B)  $i^3 - 24i^2 - 24i + a^3$

D)  $16 - 24i + i^3$

141) \_\_\_\_\_

Answer: C

142)  $-9i(-2 + 9i)^2$

A)  $693 + 324i$

C)  $-324 + 693i$

B)  $-324i + 324i^2 - 729i^3$

D)  $693i$

142) \_\_\_\_\_

Answer: C

143)  $(\sqrt{2} + 3i)(\sqrt{2} - 3i)$

A) 11

B)  $2 - 9i$

C) -1

D)  $2 + 9i$

143) \_\_\_\_\_

Answer: A

144)  $(2 + i)(2 - i)(2 + 4i)$

A)  $10 + 4i$

B)  $6 + 12i$

C)  $10 + 20i$

D)  $8 - 4i^3$

144) \_\_\_\_\_

Answer: C

**Simplify the power of i.**

145)  $i^{92}$

A) -i

B) i

C) 1

D) -1

145) \_\_\_\_\_

Answer: C

146)  $i^{30}$

A) i

B) -i

C) 1

D) -1

146) \_\_\_\_\_

Answer: D

147)  $i^{53}$

A) i

B) -1

C) 1

D) -i

147) \_\_\_\_\_

Answer: A

148)  $i^{67}$

A) i

B) -i

C) 1

D) -1

148) \_\_\_\_\_

Answer: B

149)  $\frac{1}{i^{47}}$

149) \_\_\_\_\_

- A) 1                      B) -i                      C) -1                      D) i  
Answer: D

150)  $\frac{1}{i^{21}}$

150) \_\_\_\_\_

- A) i                      B) -i                      C) 1                      D) -1  
Answer: B

151)  $i^{-54}$

151) \_\_\_\_\_

- A) -i                      B) i                      C) -1                      D) 1  
Answer: C

152)  $i^{-59}$

152) \_\_\_\_\_

- A) 1                      B) -1                      C) -i                      D) i  
Answer: D

153)  $\frac{1}{i^{-10}}$

153) \_\_\_\_\_

- A) -1                      B) -i                      C) i                      D) 1  
Answer: A

154)  $\frac{1}{i^{-19}}$

154) \_\_\_\_\_

- A) -i                      B) i                      C) -1                      D) 1  
Answer: A

**Find the quotient. Write the answer in standard form.**

155)  $\frac{9 + 2i}{4 - 3i}$

155) \_\_\_\_\_

- A)  $6 - 1i$                       B)  $\frac{6}{5} + \frac{7}{5}i$                       C)  $\frac{42}{5} + \frac{19}{5}i$                       D)  $\frac{6}{7} - 1i$   
Answer: B

156)  $\frac{3 + 3i}{5 + 3i}$

156) \_\_\_\_\_

- A)  $\frac{12}{17} + \frac{3}{17}i$                       B)  $\frac{3}{4} - \frac{3}{16}i$                       C)  $\frac{3}{8} - \frac{3}{16}i$                       D)  $\frac{6}{17} - \frac{24}{17}i$   
Answer: A

157)  $\frac{9 - 6i}{5 + 6i}$

157) \_\_\_\_\_

- A)  $\frac{81}{61} - \frac{24}{61}i$                       B)  $\frac{9}{61} - \frac{84}{61}i$                       C)  $\frac{9}{11} - \frac{84}{11}i$                       D)  $\frac{81}{11} - \frac{84}{11}i$   
Answer: B

158)

$$\frac{3 - 9i}{5 - 7i} \quad 158)$$

$$A) \frac{39}{37} - \frac{12}{37}i$$

$$B) \frac{48}{37} + \frac{66}{37}i$$

$$C) \frac{13}{8} - \frac{1}{2}i$$

$$D) \frac{1}{2} - \frac{2}{2}i$$

Answer: A

$$159) \frac{8 + 3i}{4 - 6i}$$

$$A) \frac{25}{13} + \frac{18}{13}i$$

$$B) \frac{7}{26} + \frac{15}{13}i$$

$$C) \frac{5}{2} + \frac{3}{2}i$$

$$D) \frac{7}{20} + \frac{3}{2}i$$

Answer: B

$$160) \frac{7 + 4i}{3 + 5i}$$

$$A) \frac{1}{16} - \frac{23}{16}i$$

$$B) \frac{1}{34} - \frac{47}{34}i$$

$$C) \frac{41}{34} - \frac{23}{34}i$$

$$D) \frac{41}{16} - \frac{23}{16}i$$

Answer: C

$$161) \frac{9 - 7i}{9 + 3i}$$

$$A) \frac{1}{36} + \frac{1}{24}i$$

$$B) \frac{17}{12} + \frac{1}{24}i$$

$$C) 34 + 12i$$

$$D) \frac{2}{3} - 1i$$

Answer: D

$$162) \frac{-10}{-i}$$

$$A) 10$$

$$B) 10i$$

$$C) -10$$

$$D) -10i$$

Answer: D

$$163) \frac{9}{-i}$$

$$A) 9$$

$$B) 9i$$

$$C) -9$$

$$D) -9i$$

Answer: B

$$164) \frac{4}{11i}$$

$$A) \frac{4}{11}i$$

$$B) \frac{4}{11}$$

$$C) \frac{4}{11}$$

$$D) \frac{4}{11}i$$

Answer: A

**Evaluate.**

$$165) x^2 + 2x + 8 \text{ if } x = 4 - 2i$$

$$A) 28 - 20i$$

$$B) 28 - 2i$$

$$C) 28 - 4i$$

$$D) 32 - 24i$$

Answer: A

$$166) x^2 - 4x - 2 \text{ if } x = -5 + 5i$$

$$A) 18 + 5i$$

$$B) 18 - 20i$$

$$C) 43 - 60i$$

$$D) 18 - 70i$$

Answer: D

- 167)  $-6x + 8x^2$  if  $x = -2 + 5i$  167) \_\_\_\_\_  
 A)  $-1332 - 1310i$  B)  $19 - 15i$  C)  $-156 - 190i$  D)  $-156 - 30i$   
 Answer: C
- 168)  $-5x + 5x^2$  if  $x = 8 - 5i$  168) \_\_\_\_\_  
 A)  $255 - 85i$  B)  $935 - 1975i$  C)  $155 + 25i$  D)  $155 - 375i$   
 Answer: D
- 169)  $9x + x^3$  if  $x = 5 - 5i$  169) \_\_\_\_\_  
 A)  $-250 - 250i$  B)  $170 + 80i$  C)  $545 - 545i$  D)  $-205 - 295i$   
 Answer: D
- 170)  $-4x + 3x^3$  if  $x = 6i$  170) \_\_\_\_\_  
 A)  $-672i$  B)  $240$  C)  $-5856i$  D)  $-240$   
 Answer: A

**Indicate whether the statement is true always, sometimes, or never.**

- 171) A real number is a complex number. 171) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: A
- 172) A complex number is an imaginary number. 172) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: B
- 173) The sum of two imaginary numbers is an imaginary number. 173) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: B
- 174) The difference between two real numbers is a real number. 174) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: A
- 175) The product of two imaginary numbers is a real number. 175) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: B
- 176) The product of a pair of complex conjugates is a real number. 176) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: A
- 177) The product of a pair of complex conjugates (with  $b \neq 0$ ) is the difference of the squares of the real and imaginary parts. 177) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: C
- 178)  $\frac{9 + 10i}{9 - 10i}$  178) \_\_\_\_\_  
 To find the quotient, multiply numerator and denominator by  $9 + 10i$ .  
 A) Always B) Sometimes C) Never  
 Answer: A

- 179) When  $i$  is raised to an even power, the result is  $-1$ . 179) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: B
- 180) When  $i$  is raised to an odd power, the result is  $-1$ . 180) \_\_\_\_\_  
 A) Always B) Sometimes C) Never  
 Answer: C

**Solve the equation or inequality.**

- 181)  $x^2 = 25$  181) \_\_\_\_\_  
 A)  $\pm\sqrt{5}$  B)  $\pm i\sqrt{5}$  C)  $\pm 5$  D)  $\pm 5i$   
 Answer: C
- 182)  $x^2 = -49$  182) \_\_\_\_\_  
 A)  $\pm 7$  B)  $\pm 7i$  C)  $\pm i\sqrt{7}$  D)  $\pm\sqrt{7}$   
 Answer: B
- 183)  $x^2 - 5 = 0$  183) \_\_\_\_\_  
 A)  $\pm i\sqrt{5}$  B)  $\pm\sqrt{5}$  C)  $\pm 5i$  D)  $\pm 5$   
 Answer: B
- 184)  $x^2 + 15 = 0$  184) \_\_\_\_\_  
 A)  $\pm 15i$  B)  $\pm i\sqrt{15}$  C)  $\pm 15$  D)  $\pm\sqrt{15}$   
 Answer: B
- 185)  $x^2 = 18$  185) \_\_\_\_\_  
 A)  $\pm 9\sqrt{2}$  B)  $\pm 3i\sqrt{2}$  C)  $\pm 9i\sqrt{2}$  D)  $\pm 3\sqrt{2}$   
 Answer: D
- 186)  $x^2 = -27$  186) \_\_\_\_\_  
 A)  $\pm 9i\sqrt{3}$  B)  $\pm 3i\sqrt{3}$  C)  $\pm 3\sqrt{3}$  D)  $\pm 9\sqrt{3}$   
 Answer: B
- 187)  $x - 5 = 0$  187) \_\_\_\_\_  
 A) 5 B)  $\sqrt{5}$  C)  $-5$  D)  $\pm 5$   
 Answer: A
- 188)  $x + 6 = 0$  188) \_\_\_\_\_  
 A) 6 B)  $-i\sqrt{6}$  C)  $-6$  D)  $i\sqrt{6}$   
 Answer: C

**Solve the problem.**

- 189) Which one of the following equations is set up for direct use of the zero-factor property? 189) \_\_\_\_\_  
 A)  $(4x + 7)(x + 6) = 0$  B)  $x^2 + x = 6$   
 C)  $4x^2 + 7x + 6 = 0$  D)  $(4x + 7)^2 = 6$   
 Answer: A
- 190) Which one of the following equations is set up for direct use of the square root property? 190) \_\_\_\_\_

A)  $4x^2 + 5x - 8 = 0$

B)  $(4x + 5)(x - 8) = 0$

C)  $x^2 + x = 8$

D)  $(4x + 5)^2 = 8$

Answer: D

191) Only one of the following equations does not require Step 1 of the method for completing the square. Which one is it? 191) \_\_\_\_\_

A)  $(2x + 5)^2 = 6$

B)  $x^2 + x = 6$

C)  $(2x + 5)(x - 6) = 0$

D)  $2x^2 + 5x - 6 = 0$

Answer: B

192) Only one of the following equations is set up so that the values of a, b, and c can be determined immediately. Which one is it? 192) \_\_\_\_\_

A)  $x^2 + x = 1$

B)  $(2x + 5)(x - 1) = 0$

C)  $2x^2 + 5x - 1 = 0$

D)  $(2x + 5)^2 = 1$

Answer: C

**Solve the equation by the zero-factor property.**193)  $x^2 + 5x - 24 = 0$  193) \_\_\_\_\_

A)  $\{-8, -3\}$

B)  $\{3, 8\}$

C)  $\{-8, 3\}$

D)  $\{-3, 8\}$

Answer: C

194)  $2x^2 = -30x - 100$  194) \_\_\_\_\_

A)  $\{-5, -10\}$

B)  $\{10, -5\}$

C)  $\{10, 5\}$

D)  $\{-10, -20\}$

Answer: A

195)  $x^2 + 4x - 32 = 0$  195) \_\_\_\_\_

A)  $\{4, -8\}$

B)  $\{-24, -8\}$

C)  $\{-4, 8\}$

D)  $\{6, -6\}$

Answer: A

196)  $21x^2 + 47x + 20 = 0$  196) \_\_\_\_\_

A)  $\left\{-\frac{4}{7}, -\frac{5}{3}\right\}$

B)  $\left\{-\frac{7}{4}, -\frac{5}{3}\right\}$

C)  $\left\{\frac{7}{4}, \frac{3}{5}\right\}$

D)  $\left\{\frac{4}{7}, \frac{5}{3}\right\}$

Answer: A

197)  $x^2 + 14x + 40 = 0$  197) \_\_\_\_\_

A)  $\{-20, -8\}$

B)  $\{2\sqrt{10}, -2\sqrt{10}\}$

C)  $\{-10, -4\}$

D)  $\{4, 10\}$

Answer: C

198)  $8x^2 + 4x - 4 = 0$  198) \_\_\_\_\_

A)  $\{2, -1\}$

B)  $\left\{\frac{1}{2}, -1\right\}$

C)  $\{2, 0\}$

D)  $\{2, 1\}$

Answer: B

**Solve the equation by the square root property.**199)  $x^2 = 121$  199) \_\_\_\_\_

A)  $\{60.5\}$

B)  $\{\pm 11\}$

C)  $\{\pm 11i\}$

D)  $\{11\}$

Answer: B

200)  $x^2 = -225$  200) \_\_\_\_\_

- A)  $\{\pm 15i\}$       B)  $\{\pm 15\}$       C)  $\{112.5\}$       D)  $\{15\}$   
 Answer: A

201)  $x^2 = 18$  201) \_\_\_\_\_

- A)  $\{\pm 3\sqrt{2}\}$       B)  $\{324\}$       C)  $\{9\}$       D)  $\{\sqrt{18}\}$   
 Answer: A

202)  $(x - 2)^2 = 81$  202) \_\_\_\_\_

- A)  $\{11\}$       B)  $\{7, -11\}$       C)  $\{-7, 11\}$       D)  $\{-79\}$   
 Answer: C

203)  $(x + 5)^2 = 13$  203) \_\_\_\_\_

- A)  $\{\sqrt{13} + 5, -\sqrt{13} + 5\}$       B)  $\{-5 \pm \sqrt{13}\}$   
 C)  $\{\sqrt{13} - \sqrt{5}\}$       D)  $\{-5 + \sqrt{13}\}$   
 Answer: B

204)  $(8x + 6)^2 = 25$  204) \_\_\_\_\_

- A)  $\left\{\frac{1}{8}, \frac{11}{8}\right\}$       B)  $\left\{-\frac{1}{8}, -\frac{11}{8}\right\}$       C)  $\left\{\frac{19}{8}\right\}$       D)  $\left\{-\frac{1}{8}, 0\right\}$   
 Answer: B

205)  $(9x + 5)^2 = 19$  205) \_\_\_\_\_

- A)  $\left\{\frac{-5 \pm \sqrt{19}}{9}\right\}$       B)  $\left\{\frac{-5 + \sqrt{19}}{9}\right\}$       C)  $\{-5 \pm \sqrt{19}\}$       D)  $\left\{\pm \frac{\sqrt{3}}{9}i\right\}$   
 Answer: A

206)  $(x + 16)^2 = -2$  206) \_\_\_\_\_

- A)  $\{-4 - \sqrt{2}\}$       B)  $\{-16 \pm i\sqrt{2}\}$       C)  $\{-14, 18\}$       D)  $\{-16 \pm \sqrt{2}\}$   
 Answer: B

**Solve the equation by completing the square.**

207)  $x^2 - 10x + 24 = 0$  207) \_\_\_\_\_

- A)  $\{\pm 2\sqrt{6}\}$       B)  $\{20, 4\}$       C)  $\{-6, -4\}$       D)  $\{6, 4\}$   
 Answer: D

208)  $x^2 + 3x - 9 = 0$  208) \_\_\_\_\_

- A)  $\left\{\frac{-3 + 3\sqrt{5}}{2}\right\}$       B)  $\left\{\frac{-3 - 3\sqrt{5}}{2}\right\}$       C)  $\{-3 \pm 3\sqrt{5}\}$       D)  $\left\{\frac{-3 \pm 3\sqrt{5}}{2}\right\}$   
 Answer: D

209)  $x^2 + 4x + 68 = 0$  209) \_\_\_\_\_

- A)  $\{-2 \pm 8i\}$       B)  $\{2 \pm 8i\}$       C)  $\{-2 \pm 2\sqrt{17}\}$       D)  $\{6, -10\}$   
 Answer: A

210)  $2x^2 + 7x + 3 = 0$  210) \_\_\_\_\_

- A)

$$\left\{-2 \pm \frac{\sqrt{3}}{2}i\right\}$$

B)

$$\left\{-3, -\frac{1}{2}\right\}$$

C)

$$\left\{\frac{-7 \pm 2\sqrt{6}}{4}\right\}$$

D)

$$\{3, -1\}$$

Answer: B

211)  $3x^2 - 4x - 7 = 0$

A)  $\left\{\frac{7}{3}, -1\right\}$

B)  $\left\{\frac{3}{7}, 1\right\}$

C)  $\left\{\frac{3}{7}, -1\right\}$

D)  $\left\{\frac{3}{7}, 0\right\}$

211) \_\_\_\_\_

Answer: A

212)  $x^2 + 9x = -18$

A)  $\{-3, -6\}$

B)  $\{-3, 6\}$

C)  $\{3, -6\}$

D)  $\{3, 6\}$

212) \_\_\_\_\_

Answer: A

213)  $x^2 + 8x = 7$

A)  $\{4 + \sqrt{23}\}$

B)  $\{-4 \pm \sqrt{23}\}$

C)  $\{-4 \pm 1\sqrt{23}\}$

D)  $\{-1 \pm \sqrt{23}\}$

213) \_\_\_\_\_

Answer: B

214)  $3x^2 - 7x = 1$

A)  $\left\{\frac{7 \pm \sqrt{61}}{6}\right\}$

B)  $\left\{-\frac{7}{6} \pm \frac{\sqrt{61}}{6}i\right\}$

C)  $\left\{\frac{-7 \pm \sqrt{61}}{6}\right\}$

D)  $\left\{\frac{7}{6} \pm \frac{\sqrt{61}}{6}i\right\}$

214) \_\_\_\_\_

Answer: A

215)  $8x^2 + 7x = -2$

A)  $\left\{\frac{7 \pm \sqrt{15}}{16}\right\}$

B)  $\left\{\frac{-7 \pm \sqrt{15}}{16}\right\}$

C)  $\left\{\frac{7}{16} \pm \frac{\sqrt{15}}{16}i\right\}$

D)  $\left\{-\frac{7}{16} \pm \frac{\sqrt{15}}{16}i\right\}$

215) \_\_\_\_\_

Answer: D

216)  $x^2 = 7 - 4x$

A)  $\{-2 \pm 2\sqrt{11}\}$

B)  $\{-2 \pm \sqrt{11}\}$

C)  $\{-1 \pm \sqrt{11}\}$

D)  $\{2 + \sqrt{11}\}$

216) \_\_\_\_\_

Answer: B

**Solve the equation using the quadratic formula.**

217)  $x^2 - 10x + 41 = 0$

A)  $\{-5 \pm 4i\}$

B)  $\{10 \pm 8i\}$

C)  $\{9, 1\}$

D)  $\{5 \pm 4i\}$

217) \_\_\_\_\_

Answer: D

218)  $x^2 + x + 2 = 0$

A)  $\left\{\frac{1 \pm \sqrt{7}}{2}i\right\}$

B)  $\left\{\frac{-1 \pm \sqrt{7}}{2}\right\}$

C)  $\left\{-\frac{1}{2} \pm \frac{\sqrt{7}}{2}i\right\}$

D)  $\left\{\frac{1 \pm \sqrt{7}}{2}\right\}$

218) \_\_\_\_\_

Answer: C

219)  $2x^2 + 12x + 3 = 0$

A)  $\left\{\frac{-6 \pm \sqrt{42}}{2}\right\}$

B)  $\left\{\frac{-12 \pm \sqrt{30}}{2}\right\}$

C)  $\left\{\frac{-6 \pm \sqrt{30}}{2}\right\}$

D)  $\left\{\frac{-6 \pm \sqrt{30}}{4}\right\}$

219) \_\_\_\_\_

Answer: C



220)  $2x^2 + 12x = -5$

A)  $\left\{ \frac{-6 \pm \sqrt{26}}{4} \right\}$

Answer: C

B)  $\left\{ \frac{-12 \pm \sqrt{26}}{2} \right\}$

C)  $\left\{ \frac{-6 \pm \sqrt{26}}{2} \right\}$

D)  $\left\{ \frac{-6 \pm \sqrt{46}}{2} \right\}$

220) \_\_\_\_\_

221)  $4x^2 = -12x - 4$

A)  $\left\{ \frac{-3 \pm \sqrt{5}}{8} \right\}$

Answer: B

B)  $\left\{ \frac{-3 \pm \sqrt{5}}{2} \right\}$

C)  $\left\{ \frac{-3 \pm \sqrt{13}}{2} \right\}$

D)  $\left\{ \frac{-12 \pm \sqrt{5}}{2} \right\}$

221) \_\_\_\_\_

222)  $\frac{4}{9}x^2 - \frac{4}{3}x = -1$

A)  $\left\{ \frac{2}{3} \right\}$

Answer: C

B)  $\left\{ -\frac{3}{2} \right\}$

C)  $\left\{ \frac{3}{2} \right\}$

D)  $\left\{ \frac{3 \pm 2\sqrt{2}}{2} \right\}$

222) \_\_\_\_\_

223)  $5 = -\frac{12}{x} - \frac{5}{x^2}$

A)  $\left\{ \frac{-6 \pm \sqrt{61}}{5} \right\}$

Answer: C

B)  $\left\{ \frac{-6 \pm \sqrt{11}}{10} \right\}$

C)  $\left\{ \frac{-6 \pm \sqrt{11}}{5} \right\}$

D)  $\left\{ \frac{-12 \pm \sqrt{11}}{5} \right\}$

223) \_\_\_\_\_

224)  $(x + 7)(x - 4) = 2$

A)  $\left\{ \frac{-3 \pm \sqrt{129}}{2} \right\}$

Answer: A

C)  $\left\{ \frac{-3 \pm i\sqrt{129}}{2} \right\}$

B)  $\left\{ -\frac{3}{2} \pm \frac{i\sqrt{129}}{2} \right\}$

D)  $\left\{ \frac{3 \pm \sqrt{129}}{2} \right\}$

224) \_\_\_\_\_

225)  $(2x - 1)(x + 1) = 6$

A)  $\left\{ \frac{1 \pm \sqrt{57}}{2} \right\}$

Answer: C

B)  $\left\{ \frac{-1 \pm \sqrt{17}}{2} \right\}$

C)  $\left\{ \frac{-1 \pm \sqrt{57}}{4} \right\}$

D)  $\left\{ \frac{1 \pm \sqrt{57}}{4} \right\}$

225) \_\_\_\_\_

**Solve the cubic equation.**

226)  $x^3 + 1 = 0$

A)  $\{-1, -1 \pm i\sqrt{3}\}$

Answer: D

B)  $\{-1, \pm i\}$

C)  $\{-1, 1 \pm i\sqrt{3}\}$

D)  $\left\{ -1, \frac{1}{2} \pm \frac{\sqrt{3}}{2}i \right\}$

226) \_\_\_\_\_

227)  $x^3 - 1 = 0$

A)  $\{1, \pm i\}$

Answer: B

B)  $\left\{ 1, -\frac{1}{2} \pm \frac{\sqrt{3}}{2}i \right\}$

C)  $\{1, 1 \pm i\sqrt{3}\}$

D)  $\{1, -1 \pm i\sqrt{3}\}$

227) \_\_\_\_\_

228)  $x^3 + 8 = 0$

A)  $\{-2, -1 \pm \sqrt{5}\}$

B)  $\{-2, 1 \pm i\sqrt{3}\}$

C)  $\{-2, \pm 2i\}$

D)  $\{-2, 1 \pm i\sqrt{6}\}$

228) \_\_\_\_\_

Answer: B

229)  $x^3 - 8 = 0$

A)  $\{2, 1 \pm i\sqrt{6}\}$

B)  $\{2, -1 \pm \sqrt{5}\}$

C)  $\{2, \pm 2i\}$

D)  $\{2, -1 \pm i\sqrt{3}\}$

229) \_\_\_\_\_

Answer: D

230)  $x^3 + 64 = 0$

A)  $\{-4, 2 \pm 2i\sqrt{3}\}$

B)  $\{-4, -2 \pm 2i\sqrt{6}\}$

C)  $\{-4, -2 \pm 2i\}$

D)  $\{-4, 2 \pm 2i\sqrt{5}\}$

230) \_\_\_\_\_

Answer: A

231)  $x^3 - 64 = 0$

A)  $\{4, 2 \pm 2\sqrt{5}\}$

B)  $\{4, 2 \pm 2i\sqrt{6}\}$

C)  $\{4, -2 \pm 2i\}$

D)  $\{4, -2 \pm 2i\sqrt{3}\}$

231) \_\_\_\_\_

Answer: D

**Solve the equation for the indicated variable.**

232)  $M = \pi r^2 h d$ , for r

A)  $r = \frac{\pm\sqrt{M\pi h d}}{\pi h d}$

B)  $r = \frac{\pm\sqrt{\pi M h d}}{h d}$

C)  $r = \frac{\pm M \sqrt{\pi h d}}{\pi h d}$

D)  $r = \pm\sqrt{\pi M h d}$

232) \_\_\_\_\_

Answer: A

233)  $A = 3\pi a^2$ , for a

A)  $a = \frac{\pm\sqrt{3\pi A}}{3\pi}$

B)  $a = \sqrt{3\pi A}$

C)  $a = \frac{\pm\sqrt{3\pi A}}{3\pi}$

D)  $a = \frac{\pm\sqrt{A\pi}}{3}$

233) \_\_\_\_\_

Answer: C

234)  $Ve = \frac{1}{2}mv^2$ , for v

A)  $v = \pm\sqrt{\frac{Ve}{2m}}$

B)  $v = \pm\frac{\sqrt{Ve}}{m}$

C)  $v = \frac{\pm\sqrt{2mVe}}{m}$

D)  $v = \pm\sqrt{2Ve}$

234) \_\_\_\_\_

Answer: C

235)  $rm = t^2 - mt$ , for t

A)  $t = \frac{m \pm \sqrt{m^2 - 4mr}}{4}$

B)  $t = \frac{m \pm \sqrt{m^2 + 4rm}}{2}$

C)  $t = \frac{m \pm \sqrt{m^2 + 4mr}}{2m}$

D)  $t = \sqrt{mr - m}$

235) \_\_\_\_\_

Answer: B

236)  $2x^2 - 4xy + 3y^2 = 1$ , for x

A)  $x = \frac{2y \pm \sqrt{2 - 2y^2}}{2}$

B)  $x = -y \pm 2\sqrt{1 - y^2}$

C)  $x = y \pm (1 - y)$

D)  $x = -y \pm \sqrt{1 - y^2}$

236) \_\_\_\_\_

Answer: A

237)  $2x^2 - 4xy + 3y^2 = 1$ , for y

A)

y

237) \_\_\_\_\_

$$= \frac{2x \pm \sqrt{6 - 4x^2}}{3}$$

B)  $y = \frac{2x \pm 2\sqrt{3 - 2x^2}}{3}$

C)  $y = \frac{2x \pm 4\sqrt{3 - 2x^2}}{3}$

D)  $y = \frac{2x \pm \sqrt{3 - 2x^2}}{3}$

Answer: D

Use the discriminant to determine the number of distinct solutions and whether they are rational, irrational, or nonreal complex.

238)  $s^2 - 6s + 5 = 0$

- A) One rational solution (a double solution)  
C) Two distinct rational solutions

Answer: C

- B) Two distinct irrational solutions  
D) Two distinct nonreal complex solutions

238) \_\_\_\_\_

239)  $t^2 + 2t + 1 = 0$

- A) Two distinct nonreal complex solutions  
C) Two distinct rational solutions

Answer: D

- B) Two distinct irrational solutions  
D) One rational solution (a double solution)

239) \_\_\_\_\_

240)  $v^2 + 2v - 4 = 0$

- A) Two distinct irrational solutions  
C) One rational solution (a double solution)

Answer: A

- B) Two distinct nonreal complex solutions  
D) Two distinct rational solutions

240) \_\_\_\_\_

241)  $w^2 + 2w + 4 = 0$

- A) Two distinct rational solutions  
C) One rational solution (a double solution)

Answer: D

- B) Two distinct irrational solutions  
D) Two distinct nonreal complex solutions

241) \_\_\_\_\_

242)  $25x^2 - 10x + 1 = 0$

- A) Two distinct rational solutions  
C) Two distinct nonreal complex solutions

Answer: D

- B) Two distinct irrational solutions  
D) One rational solution (a double solution)

242) \_\_\_\_\_

243)  $4y^2 = 2y - 5$

- A) One rational solution (a double solution)  
C) Two distinct rational solutions

Answer: B

- B) Two distinct nonreal complex solutions  
D) Two distinct irrational solutions

243) \_\_\_\_\_

244)  $4 + 6z^2 = -2z$

- A) Two distinct irrational solutions  
C) Two distinct rational solutions

Answer: B

- B) Two distinct nonreal complex solutions  
D) One rational solution (a double solution)

244) \_\_\_\_\_

245)  $-2 - 6a^2 = 2a - 3$

- A) Two distinct rational solutions  
C) Two distinct irrational solutions

Answer: C

- B) One rational solution (a double solution)  
D) Two distinct nonreal complex solutions

245) \_\_\_\_\_

Find the values of a, b, and c for which the quadratic equation  $ax^2 + bx + c = 0$  has the given numbers as solutions.  
Then use those values to write a quadratic equation.

246) 4, 4 246) \_\_\_\_\_  
 A)  $x^2 - 8x + 16 = 0$       B)  $x^2 + 16x - 8 = 0$       C)  $x^2 + 16x + 8 = 0$       D)  $x^2 + 8x + 16 = 0$   
 Answer: A

247) -4, -8 247) \_\_\_\_\_  
 A)  $x^2 - 12x + 32 = 0$       B)  $x^2 + 32x - 12 = 0$   
 C)  $x^2 + 12x + 32 = 0$       D)  $x^2 + 32x + 12 = 0$   
 Answer: C

248) 2, -7 248) \_\_\_\_\_  
 A)  $x^2 + 5x - 14 = 0$       B)  $x^2 - 14x + 5 = 0$       C)  $x^2 - 14x - 5 = 0$       D)  $x^2 - 5x - 14 = 0$   
 Answer: A

249) -2, 6 249) \_\_\_\_\_  
 A)  $x^2 - 4x - 12 = 0$       B)  $x^2 - 12x - 4 = 0$       C)  $x^2 + 4x - 12 = 0$       D)  $x^2 - 12x + 4 = 0$   
 Answer: A

250)  $5 + \sqrt{7}$ ,  $5 - \sqrt{7}$  250) \_\_\_\_\_  
 A)  $x^2 - 10x + 18 = 0$       B)  $x^2 - 10x + 32 = 0$   
 C)  $x^2 + 10x + 18 = 0$       D)  $x^2 + 25x + 32 = 0$   
 Answer: A

251)  $3 + 6\sqrt{7}$ ,  $3 - 6\sqrt{7}$  251) \_\_\_\_\_  
 A)  $x^2 - 6x - 243 = 0$       B)  $x^2 - 3x - 33 = 0$   
 C)  $x^2 + 243x + 6 = 0$       D)  $x^2 - 9x + 261 = 0$   
 Answer: A

252) 6i, -6i 252) \_\_\_\_\_  
 A)  $x^2 - 12 - 36 = 0$       B)  $x^2 + 12 + 36 = 0$       C)  $x^2 - 36 = 0$       D)  $x^2 + 36 = 0$   
 Answer: D

253) 18i, -18i 253) \_\_\_\_\_  
 A)  $x^2 + 324 = 0$       B)  $x^2 - 324 = 0$   
 C)  $x^2 - 36 - 324 = 0$       D)  $x^2 + 36 + 324 = 0$   
 Answer: A

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

- 52) D
- 53) A
- 54) B
- 55) C
- 56) C
- 57) D
- 58) A
- 59) A
- 60) A
- 61) A
- 62) B
- 63) C
- 64) C
- 65) C
- 66) C
- 67) C
- 68) B
- 69) C
- 70) D
- 71) C
- 72) D
- 73) A
- 74) C
- 75) D
- 76) D
- 77) A
- 78) A
- 79) D
- 80) C
- 81) C
- 82) B
- 83) C
- 84) A
- 85) A
- 86) C
- 87) D
- 88) C
- 89) B
- 90) A
- 91) D
- 92) B
- 93) B
- 94) C
- 95) C
- 96) A
- 97) C
- 98) D
- 99) A
- 100) B
- 101) A
- 102) D
- 103) B

104) A  
105) D  
106) C  
107) B  
108) B  
109) B  
110) D  
111) D  
112) C  
113) C  
114) A  
115) B  
116) B  
117) D  
118) A  
119) C  
120) A  
121) A  
122) B  
123) B  
124) D  
125) C  
126) D  
127) B  
128) D  
129) A  
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131) B  
132) B  
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134) A  
135) D  
136) C  
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144) C  
145) C  
146) D  
147) A  
148) B  
149) D  
150) B  
151) C  
152) D  
153) A  
154) A  
155) B

156) A  
157) B  
158) A  
159) B  
160) C  
161) D  
162) D  
163) B  
164) A  
165) A  
166) D  
167) C  
168) D  
169) D  
170) A  
171) A  
172) B  
173) B  
174) A  
175) B  
176) A  
177) C  
178) A  
179) B  
180) C  
181) C  
182) B  
183) B  
184) B  
185) D  
186) B  
187) A  
188) C  
189) A  
190) D  
191) B  
192) C  
193) C  
194) A  
195) A  
196) A  
197) C  
198) B  
199) B  
200) A  
201) A  
202) C  
203) B  
204) B  
205) A  
206) B  
207) D



208) D  
209) A  
210) B  
211) A  
212) A  
213) B  
214) A  
215) D  
216) B  
217) D  
218) C  
219) C  
220) C  
221) B  
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223) C  
224) A  
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226) D  
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228) B  
229) D  
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233) C  
234) C  
235) B  
236) A  
237) D  
238) C  
239) D  
240) A  
241) D  
242) D  
243) B  
244) B  
245) C  
246) A  
247) C  
248) A  
249) A  
250) A  
251) A  
252) D  
253) A