

Do the following problems as indicated.

Simplify the radical. Simplify. Assume that all variables represent positive number.

1) $\sqrt{132}$

2) $\sqrt{28}$

3) $-\sqrt{\frac{68}{81}}$

4) $\sqrt{\frac{63}{324}}$

5) $\sqrt{486x^2}$

6) $\sqrt{12k^7q^8}$

7) $\sqrt{\frac{x^9}{49}}$

8) $\sqrt{\frac{18x^2y}{49}}$

Perform indicated operations. Simplify.

9) $4\sqrt{72} + 7\sqrt{200}$

10) $-5\sqrt{50} + 5\sqrt{162} - 4\sqrt{8}$

11) $\sqrt{18} + 5\sqrt{162} + 3\sqrt{50}$

12) $x\sqrt{3x} + 7\sqrt{75x^3} - 2x\sqrt{75x}$

13) $\sqrt{7}(\sqrt{63} + \sqrt{21})$

14) $\sqrt{72} \cdot \sqrt{50}$

15) $(\sqrt{6} - \sqrt{12})(\sqrt{2} + \sqrt{3})$

16) $(7\sqrt{11} + 5)(8\sqrt{11} + 2)$

17) $(\sqrt{2} + \sqrt{11})(\sqrt{2} - \sqrt{11})$

18) $(4\sqrt{11} + 2)^2$

19) $\frac{\sqrt{140}}{\sqrt{5}}$

20) $\frac{\sqrt{384x^7}}{\sqrt{6x}}$

Rationalize the denominator and simplify. Assume that all variables represent positive real numbers.

21) $\sqrt{\frac{3}{20}}$

22) $\sqrt{\frac{64}{3}}$

23) $\sqrt{\frac{81}{2}}$

Rationalize the denominator and simplify.

24) $\frac{7}{\sqrt{6} + \sqrt{13}}$

25) $\frac{6 - \sqrt{7}}{6 + \sqrt{7}}$

26) $\frac{4}{9 - \sqrt{6}}$

27) $\frac{\sqrt{3} + 1}{\sqrt{3} - \sqrt{2}}$

Solve the equation.

28) $\sqrt{x+2} = 6$

29) $\sqrt{3x+4} + 6 = 11$

30) $\sqrt{10x-24} = \sqrt{x}$

31) $\sqrt{18x+9} = x+5$

Find the length of the unknown side of the right triangle with sides a, b, and c, where c is the hypotenuse.

32) $a = 4, b = 18$

33) $a = 10, c = 2\sqrt{106}$

34) $b = \sqrt{2}, c = \sqrt{5}$

Use the square root property to solve the quadratic equation.

35) $(x-4)^2 = 36$

36) $(4x+5)^2 = 10$

Solve the equation by completing the square.

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

38) $z^2 + 12z + 17 = 0$

39) $2x^2 + 4x + 7 = 0$

Use the quadratic formula to solve the equation. Express radicals in simplest form.

40) $5m^2 + 8m + 2 = 0$

41) $7x^2 + 10x = -2$

Choose and use a method to solve the equation.

42) $5k^2 - 14k - 3 = 0$

43) $x^2 + x + 4 = 0$

44) $7n^2 = -12n - 2$

Write the expression in i notation.

45) $\sqrt{-104}$

46) $\sqrt{-243}$

Add or subtract as indicated.

47) $(6 + 9i) - (-2 + i)$

48) $(4 - 9i) + (6 + 3i)$

Multiply.

49) $6i(6 - 8i)$

50) $(6 - 2i)(3 + 7i)$

51) $(8 + 5i)(8 - 5i)$

52) $(2 - 4i)^2$

Divide. Write the result in standard form.

53) $\frac{5 - 3i}{6 + 4i}$

54) $\frac{6 - 6i}{5 - 6i}$

Solve the quadratic equation for complex solutions.

55) $(5x + 2)^2 = -6$

56) $x^2 + x + 4 = 0$

57) $7x^2 - 5x = -9$

Sketch the graph of the equation. Identify the vertex.

58) $y = 4x^2$

59) $y = x^2 - 1$

60) $y = x^2 - 2x$

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

Answer Key

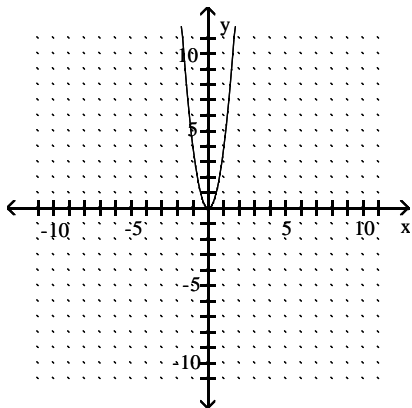
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- 1) $2\sqrt{33}$
- 2) $2\sqrt{7}$
- 3) $-\frac{2\sqrt{17}}{9}$
- 4) $\frac{\sqrt{7}}{6}$
- 5) $9x\sqrt{6}$
- 6) $2k^3q^4\sqrt{3k}$
- 7) $\frac{x^4\sqrt{x}}{7}$
- 8) $\frac{3x\sqrt{2y}}{7}$
- 9) $94\sqrt{2}$
- 10) $12\sqrt{2}$
- 11) $63\sqrt{2}$
- 12) $26x\sqrt{3x}$
- 13) $21 + 7\sqrt{3}$
- 14) 60
- 15) $2\sqrt{3} + 3\sqrt{2} - 2\sqrt{6} - 6$
- 16) $626 + 54\sqrt{11}$
- 17) -9
- 18) $180 + 16\sqrt{11}$
- 19) $2\sqrt{7}$
- 20) $8x^3$
- 21) $\frac{\sqrt{15}}{10}$
- 22) $\frac{8\sqrt{3}}{3}$
- 23) $\frac{9\sqrt{2}}{2}$
- 24) $\sqrt{13} - \sqrt{6}$
- 25) $\frac{43 - 12\sqrt{7}}{29}$
- 26) $\frac{36 + 4\sqrt{6}}{75}$
- 27) $3 + \sqrt{6} + \sqrt{3} + \sqrt{2}$
- 28) $x = 34$
- 29) 7
- 30) $x = \frac{8}{3}$
- 31) $x = 4$
- 32) $2\sqrt{85}$
- 33) 18
- 34) $\sqrt{3}$
- 35) $x = 10, -2$
- 36) $x = \frac{-5 \pm \sqrt{10}}{4}$
- 37) $x = -4 \pm \sqrt{23}$
- 38) $z = -6 \pm \sqrt{19}$
- 39) no real solution
- 40) $\frac{-4 \pm \sqrt{6}}{5}$
- 41) $\frac{-5 \pm \sqrt{11}}{7}$
- 42) $-\frac{1}{5}, 3$
- 43) no real solution
- 44) $\frac{-6 \pm \sqrt{22}}{7}$
- 45) $2i\sqrt{26}$
- 46) $9i\sqrt{3}$
- 47) $8 + 8i$
- 48) $10 - 6i$
- 49) $48 + 36i$
- 50) $32 + 36i$
- 51) 89
- 52) $-12 - 16i$
- 53) $\frac{9}{26} - \frac{19}{26}i$
- 54) $\frac{66}{61} + \frac{6}{61}i$
- 55) $x = \frac{-2 \pm i\sqrt{6}}{5}$
- 56) $x = \frac{-1 \pm i\sqrt{15}}{2}$
- 57) $x = \frac{5 \pm i\sqrt{227}}{14}$

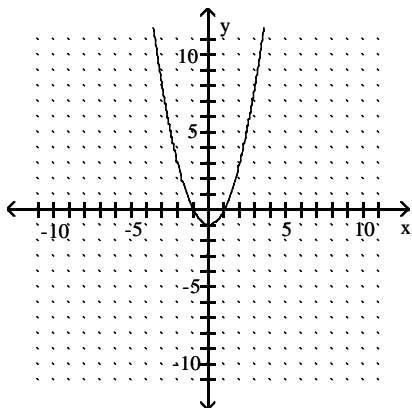
Answer Key

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58)

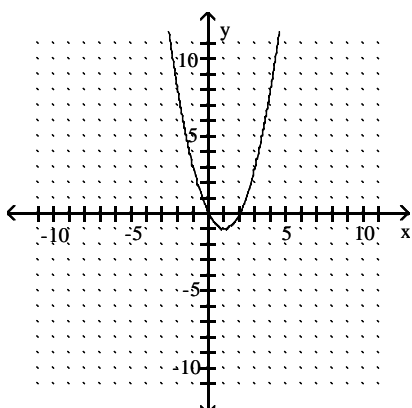


59)



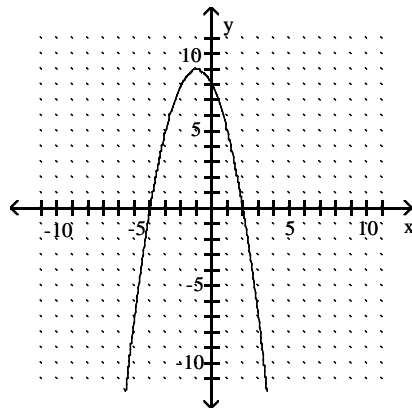
vertex: $(0, -1)$; x-intercepts: $(-1, 0)$ and $(1, 0)$;
y-intercept: $(0, -1)$

60)



vertex: $(1, -1)$;
x-intercepts: $(0, 0)$ and $(2, 0)$;
y-intercept: $(0, 0)$

61)



vertex: $(-1, 9)$;
x-intercepts: $(-4, 0)$ and $(2, 0)$;
y-intercept: $(0, 8)$