

1. Add or subtract.

$$\frac{7\sqrt{3}}{3} - \frac{\sqrt{12}}{3}$$

$$\frac{7\sqrt{3}}{3} - \frac{\sqrt{12}}{3} = \square$$

(Type an exact answer, using radicals as needed. Simplify your answer.)

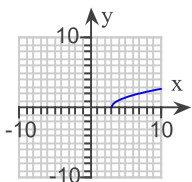
2. Identify the domain and then graph the function.

$$f(x) = \sqrt{x+3}$$

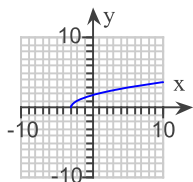
The domain is  $\square$ . (Type your answer in interval notation.)

Choose the correct graph below.

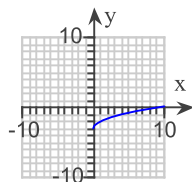
A.



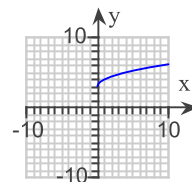
B.



C.



D.



3. Simplify by factoring. Assume that all variables under radicals represent nonnegative numbers.

$$\sqrt{x^4}$$

$$\sqrt{x^4} = \square$$

(Type an exact answer, using radicals as needed.)

4. Simplify.

$$\sqrt[3]{x^{12}}$$

$$\sqrt[3]{x^{12}} = \square$$

(Type an exact answer, using radicals as needed.)

5. Simplify, using  $i$  notation as needed.

$$\sqrt{-294}$$

The answer is  $\square$ .

(Simplify your answer. Type an exact answer, using radicals and  $i$  as needed.)

6. Rationalize the denominator of  $\frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$ .

$$\frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}} = \square$$

(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Rationalize the denominator.)

7. Multiply, and then simplify if possible.

$$(\sqrt{3} - \sqrt{10})^2$$

$$(\sqrt{3} - \sqrt{10})^2 = \square$$

(Simplify your answer. Do not factor. Type an exact answer, using radicals as needed.)

8. Simplify. Assume that all variables represent positive real numbers.

$$\sqrt{4x^4}$$

$$\sqrt{4x^4} = \square$$

(Type an exact answer, using radicals as needed. Simplify your answer.)

9. Simplify the given expression. Write the answer with positive exponents. Assume that all variables represent positive numbers.

$$\frac{(x^3z)^{\frac{1}{6}}}{x^{-\frac{1}{2}}z^{\frac{1}{3}}}$$

$$\frac{(x^3z)^{\frac{1}{6}}}{x^{-\frac{1}{2}}z^{\frac{1}{3}}} = \square$$

(Simplify your answer. Type exponential notation with positive exponents. Use integers or fractions for any numbers in the expression.)

10. Add or subtract. Assume that all variables represent positive real numbers.

$$\sqrt{4x^3} + \sqrt{9x^3} - \sqrt{100x^3}$$

$$\sqrt{4x^3} + \sqrt{9x^3} - \sqrt{100x^3} = \square$$

(Type an exact answer, using radicals as needed.)

11. Find the distance between the pair of points. Give an exact answer and a three-decimal-place approximation.

$$(-7, -6) \text{ and } (5, -7)$$

The exact distance is  units.

(Type an exact answer, using radicals as needed. Simplify your answer.)

The decimal approximation is  units.

(Type an integer or decimal rounded to three decimal places as needed.)

12. Find the length of the unknown side of the given triangle.



The side is  m.

(Type an exact answer, using radicals as needed. Simplify your answer)

13. Rationalize the denominator of  $\frac{5}{\sqrt{9x}}$ . Assume that all variables represent positive real numbers.

$$\frac{5}{\sqrt{9x}} = \text{} \text{ (Type an exact answer, using radicals as needed.)}$$

14. Find the root. Assume that the variable represents a positive number.

$$\sqrt{64x^6}$$

$$\sqrt{64x^6} = \text{}$$

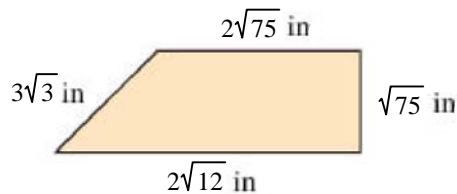
15. Use the properties of exponents to simplify the expression. Write with positive exponents. Assume that all variables represent positive real numbers.

$$d^{\frac{1}{3}} \cdot d^{\frac{4}{3}}$$

$$d^{\frac{1}{3}} \cdot d^{\frac{4}{3}} = \text{}$$

(Simplify your answer. Type exponential notation with positive exponents.)

16. Find the perimeter of the trapezoid.



The perimeter of the trapezoid is  in.

(Simplify your answer. Type an exact answer, using radicals as needed.)

17. Simplify. Assume that all variables represent positive real numbers.

$$\sqrt{81x^{10}y^6}$$

$$\sqrt{81x^{10}y^6} = \text{$$

(Type an exact answer, using radicals as needed. Simplify your answer.)

18. Use the quotient rule to simplify. Assume that all variables represent positive real numbers.

$$\sqrt{\frac{13x^2}{4y^2}}$$

$$\sqrt{\frac{13x^2}{4y^2}} = \text{$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

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

$$\sqrt{\frac{25}{x}}$$

$$\sqrt{\frac{25}{x}} = \text{ (Type an exact answer, using radicals as needed.)$$

20. Multiply. Assume that all variables represent positive real numbers.

$$x^{\frac{1}{3}}(3x - 3)$$

$$x^{\frac{1}{3}}(3x - 3) = \text{$$

(Simplify your answer. Type your answer using exponential notation. Use integers or fractions for any numbers in the expression.)

21. Solve.

$$\sqrt[3]{5x} = -3$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A.  $x = \blacksquare$   
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. There is no real solution.

22. Add.

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

$$(5 - 8i) + (3 + 5i) = \square$$

(Simplify your answer. Type your answer in the form  $a + bi$ .)

23. Solve.

$$\sqrt{3x - 5} = \sqrt{5 - 3x}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A.  $x = \blacksquare$   
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. There is no real solution.

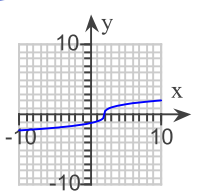
24. Identify the domain and then graph the function.

$$g(x) = \sqrt[3]{x - 2}$$

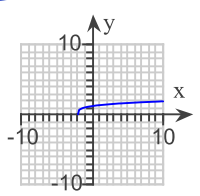
The domain is  $\square$ . (Type your answer in interval notation.)

Choose the correct graph below.

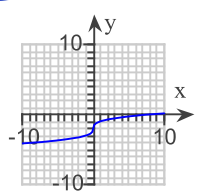
A.



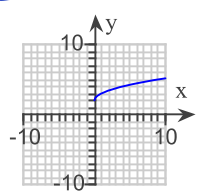
B.



C.



D.



25. Multiply. Assume that all variables represent positive real numbers.

$$(3\sqrt{x} + 1)(2\sqrt{x} + 8)$$

$$(3\sqrt{x} + 1)(2\sqrt{x} + 8) = \square$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

26. A spotlight is mounted on the eaves of a house 24 feet above the ground. A flower bed runs between the house and the sidewalk, so the closest the ladder can be placed to the house is 18 feet. How long a ladder is needed so that an electrician can reach the place where the light is mounted?

The length of the ladder needs to be  $\square$  ft.

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

$$\frac{-9}{\sqrt{x} - 4}$$

$$\frac{-9}{\sqrt{x} - 4} = \square$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

28. Use radical notation to write the expression. Simplify if possible.

$$(-8)^{\frac{2}{3}}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

A.  $(-8)^{\frac{2}{3}} = \square$

B. The answer is not a real number.

29. Use radical notation to write the expression. Simplify if possible. Assume that all variables represent nonnegative quantities.

$$(49x^{10})^{\frac{1}{2}}$$

$$(49x^{10})^{\frac{1}{2}} = \square$$

30. If  $f(x) = \sqrt{2x + 3}$ , find  $f(10)$ .

$f(10) = \square$  (Type an exact answer, using radicals as needed. Simplify your answer.)

31. Solve.

$$\sqrt{5x - 9} = 6$$

Select the correct choice below and fill in any answer boxes present in your choice.

A.  $x = \square$

(Simplify your answer. Use a comma to separate answers as needed.)

B. There is no solution.

32. Use the quotient rule to simplify. Assume that all variables represent positive real numbers.

$$\sqrt[3]{\frac{x}{64}}$$

$$\sqrt[3]{\frac{x}{64}} = \square$$

(Type an exact answer, using radicals as needed. Simplify your answer.)

1.  $\frac{5\sqrt{3}}{3}$

2.  $[-3, \infty)$   
B

3.  $x^2$

4.  $x^4$

5.  $7i\sqrt{6}$

6.  $5 - 2\sqrt{6}$

7.  $13 - 2\sqrt{30}$

8.  $2x^2$

9.  $\frac{x}{\frac{1}{z^6}}$

10.  $-5x\sqrt{x}$

11.  $\sqrt{145}$   
12.042

12.  $4\sqrt{3}$

13.  $\frac{5\sqrt{x}}{3x}$

14.  $8x^3$



15.  $\frac{5}{d^3}$
- 
16.  $22\sqrt{3}$
- 
17.  $9x^5y^3$
- 
18.  $\frac{x\sqrt{13}}{2y}$
- 
19.  $\frac{5\sqrt{x}}{x}$
- 
20.  $3x^{\frac{4}{3}} - 3x^{\frac{1}{3}}$
- 
21. A,  $-\frac{27}{5}$
- 
22.  $8 - 3i$
- 
23. A,  $\frac{5}{3}$
- 
24.  $(-\infty, \infty)$   
A
- 
25.  $6x + 26\sqrt{x} + 8$
- 
26. 30
- 
27.  $\frac{-9(\sqrt{x} + 4)}{x - 16}$
- 
28. A, 4
- 
29.  $7x^5$
-

30.  $\sqrt{23}$

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31. A, 9

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32.  $\frac{\sqrt[3]{x}}{4}$

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