Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Algebra 1 Chapter 10 Review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

Simplify the radical expression.

____ 1. $\sqrt{144}$

a. 12 b. $12\sqrt{2}$ c. 6 d. $4\sqrt{6}$

Simplify the radical expression by rationalizing the denominator.

____ 2. $\dfrac{4}{\sqrt{21}}$

a. $\dfrac{4\sqrt{21}}{21}$ b. $4\sqrt{21}$ c. $21\sqrt{4}$ d. $\dfrac{\sqrt{441}}{21}$

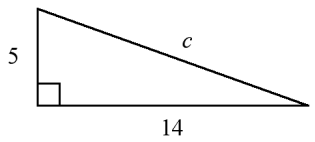
____ 3. A square garden plot has an area of 24 ft^2.
a. Find the length of each side in simplest radical form.
b. Calculate the length of each side to the nearest tenth of a foot.

a. $\dfrac{\sqrt{24}}{2}$; 2.45 ft c. $\dfrac{24}{4}$; 6 ft

b. $2\sqrt{6}$; 4.9 ft d. $\sqrt{24}$; 5 ft

Find the length of the missing side. If necessary, round to the nearest tenth.

____ 4.



a. 361 b. 19 c. 38 d. 14.9

Determine whether the given lengths can be sides of a right triangle.

____ 5. 18 m, 24 m, 30 m

a. no b. yes

____ 6. 7 cm, 40 cm, 41 cm

a. no b. yes

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

____ 7. Two consecutive positive integers form part of a Pythagorean triple.
a. never b. always c. sometimes

Simplify the expression.

____ 8. $\sqrt{6} + 2\sqrt{6}$
a. $3\sqrt{6}$ b. $-\sqrt{6}$ c. $3\sqrt{12}$ d. $-\sqrt{12}$

____ 9. $4\sqrt{7} + 8\sqrt{63}$
a. $76\sqrt{7}$ b. $12\sqrt{63}$ c. $28\sqrt{7}$ d. $28\sqrt{63}$

____ 10. $(6 - \sqrt{11})(6 + \sqrt{11})$
a. $36 + \sqrt{11}$ c. -85
b. $47 + 12\sqrt{11}$ d. 25

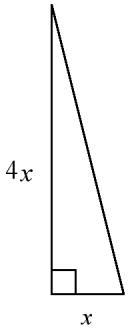
____ 11. $\dfrac{8}{\sqrt{6} - \sqrt{3}}$
a. $\dfrac{8\sqrt{6} - 8\sqrt{3}}{3}$ c. $\dfrac{8\sqrt{6} + 8\sqrt{3}}{\sqrt{27}}$
b. $\dfrac{8\left(\sqrt{6} + \sqrt{3}\right)}{9}$ d. $\dfrac{8\sqrt{6} + 8\sqrt{3}}{3}$

____ 12. $\dfrac{\sqrt{2} + \sqrt{6}}{\sqrt{8} + \sqrt{6}}$
a. $\dfrac{\sqrt{12} + 6 - \sqrt{16} - \sqrt{48}}{-2}$ c. $\dfrac{\sqrt{8}}{\sqrt{14}}$
b. $\sqrt{3} - 1$ d. $\dfrac{1}{\sqrt{4}} + 1$

____ 13. Find an exact solution for $\dfrac{\sqrt{5} - 1}{x} = \dfrac{\sqrt{5}}{2}$. Then find the approximate solution to the nearest tenth.
a. $\dfrac{10 - 2\sqrt{5}}{5}$; 1.1 c. -2; -2
b. $2 - 2\sqrt{5}$; -2.5 d. $\dfrac{2\sqrt{5} - 2}{\sqrt{5}}$; 1.1

____ 14. The formula $r = \sqrt{\dfrac{A}{P}} - 1$ gives the interest rate r that will allow principal P to grow into amount A in two years, if the interest is compounded annually. Suppose you have \$425 to deposit into an account. Find the interest rate you would need to have \$470 in the account at the end of the second year.
a. 5.2% b. 105% c. 0.052% d. 5.4%

____ 15. Find the exact perimeter of the triangle.



a. $68\sqrt{x}$ b. $\sqrt{68x}$ c. $5x + x\sqrt{17}$ d. $68x$

Solve the equation. Check your solution.

____ 16. $4 = \sqrt{m} - 8$

a. 6 b. 144 c. $2\sqrt{3}$ d. 12

____ 17. $\sqrt{r+5} = 11$

a. 126 b. 6 c. 17 d. 116

____ 18. The velocity of sound in air is given by the equation $v = 20\sqrt{273 + t}$ where v is the velocity in meters per second and t is the temperature in degrees Celsius. Find the temperature when the velocity of sound in air is 369 meters per second. Round to the nearest degree.

a. 507º b. 6,535º c. 7,081º d. 67º

Solve the equation. Identify any extraneous solutions.

____ 19. $w = \sqrt{7w}$

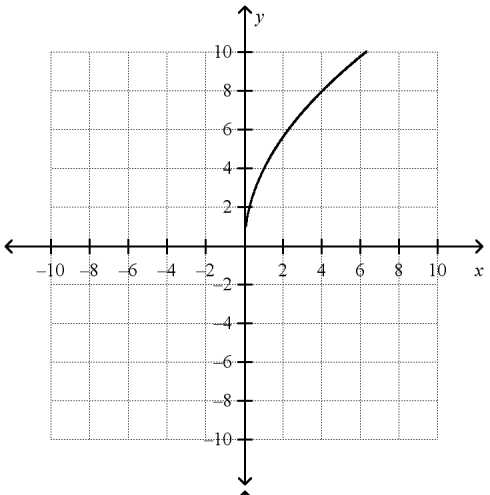
a. 0 and 7 are solutions of the original equation.
b. 0 is a solution of the original equation. 7 is an extraneous solution.
c. 7 is a solution of the original equation. 0 is an extraneous solution.
d. –7 is a solution of the original equation. 0 is an extraneous solution.

____ 20. The formula $v = \sqrt{64h}$ can be used to find the velocity v in feet per second of an object that has fallen h feet. Find the velocity of an object that has fallen 25 feet. Round your answer to the nearest hundredth.

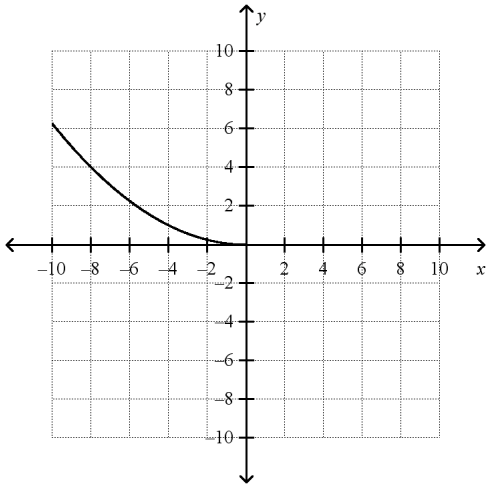
a. 800 feet per second
b. 320 feet per second
c. 200 feet per second
d. 40 feet per second

_____ 21. Graph the function $f(x) = -4\sqrt{x}$.

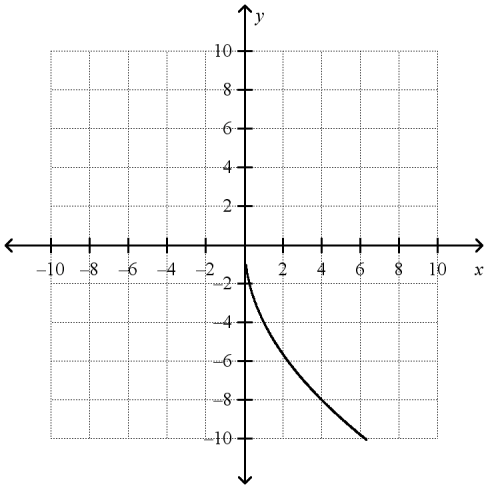
a.



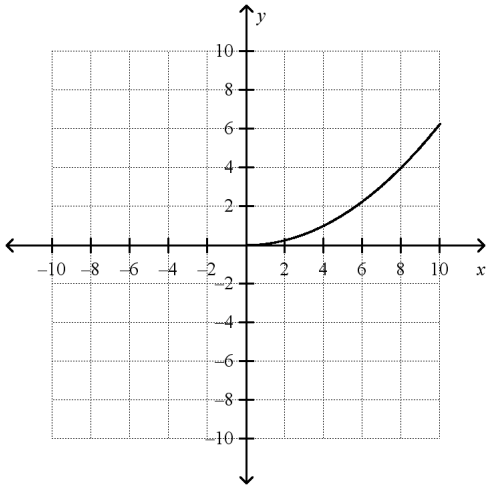
c.



b.



d.

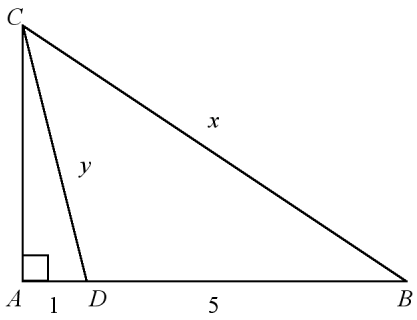


Short Answer

22. The sales of a certain product after an initial release can be found by the equation $s = 16\sqrt{3t} + 25$, where s represents the total sales (in thousands) and t represents the time in weeks after release.
a. Make a table of values.
b. Graph the function.
c. Use the graph to estimate the sales 7 weeks after release.

Essay

23. In the diagram $y = \sqrt{17}$. Use the Pythagorean Theorem to find x. Express x as a radical expression in simplest form. Show your work.



24. Simplify $\left(2\sqrt{5}+3\sqrt{7}\right)^2$. Show your work. Justify each step

25. Solve $\sqrt{3x}-1=-4$. Check your solution. If there is no solution, write *no solution*. Show your work.

Algebra 1 Chapter 10 Review
Answer Section

MULTIPLE CHOICE

1. ANS: A PTS: 1 DIF: L2 REF: 10-1 Simplifying Radicals
   OBJ: 10-1.1 Simplifying Radical Expressions Involving Products
   STA: CA A1 2.0 TOP: 10-1 Example 1
   KEY: radical expressions | Multiplication Property of Square Roots | square root
2. ANS: A PTS: 1 DIF: L2 REF: 10-1 Simplifying Radicals
   OBJ: 10-1.2 Simplifying Radical Expressions Involving Quotients
   STA: CA A1 2.0 TOP: 10-1 Example 7
   KEY: radical expressions | rationalize | radicand in the denominator
3. ANS: B PTS: 1 DIF: L3 REF: 10-1 Simplifying Radicals
   OBJ: 10-1.1 Simplifying Radical Expressions Involving Products
   STA: CA A1 2.0 KEY: word problem | problem solving | radical expressions | multi-part question
4. ANS: D PTS: 1 DIF: L2 REF: 10-2 The Pythagorean Theorem
   OBJ: 10-2.1 Solving Problems Using the Pythagorean Theorem
   STA: CA A1 2.0 | CA A1 24.2 TOP: 10-2 Example 1
   KEY: Pythagorean Theorem | right triangle
5. ANS: B PTS: 1 DIF: L2 REF: 10-2 The Pythagorean Theorem
   OBJ: 10-2.2 Identifying Right Triangles STA: CA A1 2.0 | CA A1 24.2
   TOP: 10-2 Example 3
   KEY: right triangle | converse of the Pythagorean Theorem | converse | Pythagorean Theorem
6. ANS: A PTS: 1 DIF: L2 REF: 10-2 The Pythagorean Theorem
   OBJ: 10-2.2 Identifying Right Triangles STA: CA A1 2.0 | CA A1 24.2
   TOP: 10-2 Example 3
   KEY: right triangle | converse of the Pythagorean Theorem | converse | Pythagorean Theorem
7. ANS: C PTS: 1 DIF: L3 REF: 10-2 The Pythagorean Theorem
   OBJ: 10-2.1 Solving Problems Using the Pythagorean Theorem
   STA: CA A1 2.0 | CA A1 24.2
   KEY: always sometimes never | Pythagorean Theorem | Pythagorean triple | reasoning
8. ANS: A PTS: 1 DIF: L2
   REF: 10-3 Operations With Radical Expressions
   OBJ: 10-3.1 Simplifying Sums and Differences STA: CA A1 2.0 | CA A1 25.0
   TOP: 10-3 Example 1 KEY: like radicals | combining like radicals
9. ANS: C PTS: 1 DIF: L2
   REF: 10-3 Operations With Radical Expressions
   OBJ: 10-3.1 Simplifying Sums and Differences STA: CA A1 2.0 | CA A1 25.0
   TOP: 10-3 Example 2
   KEY: like radicals | combining like radicals | radical expressions
10. ANS: D PTS: 1 DIF: L2
    REF: 10-3 Operations With Radical Expressions
    OBJ: 10-3.2 Simplifying Products and Quotients STA: CA A1 2.0 | CA A1 25.0
    TOP: 10-3 Example 4
    KEY: FOIL | radical expressions | Multiplication Property of Square Roots

11. ANS: D PTS: 1 DIF: L3
REF: 10-3 Operations With Radical Expressions
OBJ: 10-3.2 Simplifying Products and Quotients STA: CA A1 2.0 | CA A1 25.0
TOP: 10-3 Example 5 KEY: radical expressions | rationalize | conjugates
12. ANS: B PTS: 1 DIF: L3
REF: 10-3 Operations With Radical Expressions
OBJ: 10-3.2 Simplifying Products and Quotients STA: CA A1 2.0 | CA A1 25.0
TOP: 10-3 Example 5 KEY: conjugates | radical expressions | FOIL | rationalize
13. ANS: A PTS: 1 DIF: L2
REF: 10-3 Operations With Radical Expressions
OBJ: 10-3.2 Simplifying Products and Quotients STA: CA A1 2.0 | CA A1 25.0
TOP: 10-3 Example 6
KEY: radical expressions | rationalize | radical equation | Multiplication Property of Square Roots
14. ANS: A PTS: 1 DIF: L3
REF: 10-3 Operations With Radical Expressions
OBJ: 10-3.2 Simplifying Products and Quotients STA: CA A1 2.0 | CA A1 25.0
KEY: radical equation | word problem | problem solving | Division Property of Square Roots
15. ANS: C PTS: 1 DIF: L4
REF: 10-3 Operations With Radical Expressions
OBJ: 10-3.2 Simplifying Products and Quotients STA: CA A1 2.0 | CA A1 25.0
KEY: Pythagorean Theorem | radical expressions | Multiplication Property of Square Roots
16. ANS: B PTS: 1 DIF: L2 REF: 10-4 Solving Radical Equations
OBJ: 10-4.1 Solving Radical Equations STA: CA A1 2.0 | CA A1 25.2
TOP: 10-4 Example 1 KEY: radical | radical equation | solving equations
17. ANS: D PTS: 1 DIF: L2 REF: 10-4 Solving Radical Equations
OBJ: 10-4.1 Solving Radical Equations STA: CA A1 2.0 | CA A1 25.2
TOP: 10-4 Example 1 KEY: radical | radical equation | solving equations
18. ANS: D PTS: 1 DIF: L2 REF: 10-4 Solving Radical Equations
OBJ: 10-4.1 Solving Radical Equations STA: CA A1 2.0 | CA A1 25.2
TOP: 10-4 Example 2
KEY: radical | radical equation | solving equations | word problem | problem solving
19. ANS: A PTS: 1 DIF: L2 REF: 10-4 Solving Radical Equations
OBJ: 10-4.2 Solving Equations With Extraneous Solutions STA: CA A1 2.0 | CA A1 25.2
TOP: 10-4 Example 4
KEY: solving equations | radical equation | extraneous solutions
20. ANS: D PTS: 1 DIF: L3 REF: 10-4 Solving Radical Equations
OBJ: 10-4.1 Solving Radical Equations STA: CA A1 2.0 | CA A1 25.2
TOP: 10-4 Example 2 KEY: radical equation | word problem | problem solving
21. ANS: B PTS: 1 DIF: L2
REF: 10-5 Graphing Square Root Functions
OBJ: 10-5.1 Graphing Square Root Functions STA: CA A1 17.0
TOP: 10-5 Example 3 KEY: graphing | square root | radical expressions

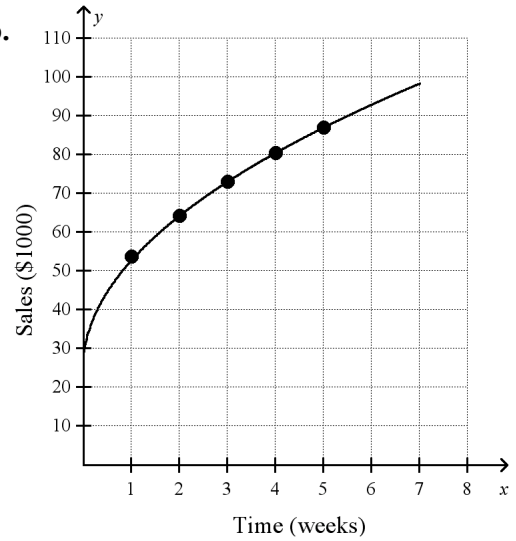
SHORT ANSWER

22. ANS:

a.

Week	*Sales*
1	53
2	64
3	73
4	80
5	87

b.



c. about $100,000

PTS: 1 DIF: L3 REF: 10-5 Graphing Square Root Functions
OBJ: 10-5.1 Graphing Square Root Functions STA: CA A1 17.0
TOP: 10-5 Example 3
KEY: graphing | square root | multi-part question | word problem | problem solving

ESSAY

23. ANS:

[4] Find the height AC of the triangle.

$$AC^2 + 1^2 = \left(\sqrt{17}\right)^2$$

$$AC^2 + 1 = 17$$

$$AC^2 + 1 - 1 = 17 - 1$$

$$AC^2 = 16$$

$$\sqrt{AC^2} = \sqrt{16}$$

$$AC^2 = 4$$

Find x.

$$AB = 5 + 1$$

$$AB = 6$$

$$x^2 = 4^2 + 6^2$$

$$x^2 = 16 + 36$$

$$x^2 = 52$$

$$\sqrt{x^2} = \sqrt{52}$$

$$x = \sqrt{4 \cdot 13}$$

$$x = 2\sqrt{13}$$

[3] answer not in simplest radical form OR one computational error

[2] two computational errors

[1] more than two error OR wrong sides used in equations

PTS: 1 DIF: L4 REF: 10-2 The Pythagorean Theorem
OBJ: 10-2.1 Solving Problems Using the Pythagorean Theorem
STA: CA A1 2.0 | CA A1 24.2
KEY: Pythagorean Theorem | right triangle | radical expressions | extended response | rubric-based question

24. ANS:

[4] $\left(2\sqrt{5}+3\sqrt{7}\right)^2$

$= \left(2\sqrt{5}+3\sqrt{7}\right)\left(2\sqrt{5}+3\sqrt{7}\right)$ definition of square

$= 4\sqrt{25}+6\sqrt{35}+6\sqrt{35}+9\sqrt{49}$ Use Foil.

$= 4\sqrt{25}+12\sqrt{35}+9\sqrt{49}$ Combine like radicals.

$= 4(5)+12\sqrt{35}+9(7)$ Simplify $\sqrt{25}$ and $\sqrt{49}$.

$= 20+12\sqrt{35}+63$ Multiply.

$= 12\sqrt{35}+83$ Add.

[3] answer not in simplest radical form OR one computational error
[2] two computational errors.
[1] more than two errors OR wrong sides used in equations

PTS: 1 DIF: L3 REF: 10-3 Operations With Radical Expressions
OBJ: 10-3.2 Simplifying Products and Quotients STA: CA A1 2.0 | CA A1 25.0
TOP: 10-3 Example 4
KEY: FOIL | radical expressions | extended response | rubric-based question

25. ANS:

[4] $\sqrt{3x} - 1 = -4$

$\sqrt{3x} = -4 + 1$

$\sqrt{3x} = -3$

$\left(\sqrt{3x}\right)^2 = (-3)^2$

$3x = 9$

$x = \frac{9}{3}$

$x = 3$

Check

$\sqrt{3x} - 1 = -4$

$\sqrt{3(3)} - 1 = -4$

$\sqrt{9} - 1 = -4$

$3 - 1 = -4$

$2 \neq -4$

$\sqrt{3x} - 1 = -4$ has no solution

[3] no conclusion stated OR one computational error

[2] wrong procedure OR two computational errors

[1] no work shown OR more than two computational errors

PTS: 1 DIF: L3 REF: 10-4 Solving Radical Equations
OBJ: 10-4.2 Solving Equations With Extraneous Solutions STA: CA A1 2.0 | CA A1 25.2
TOP: 10-4 Example 5
KEY: radical equation | extraneous solutions | solving equations | extended response | rubric-based question