

Chapter 6 REVIEW

Multiple Choice

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

What is a simpler form of the radical expression?

A

1. $\sqrt[4]{81x^{20}y^8} = \sqrt[4]{3^4(x^5)^4(y^2)^4} = 3|x^5|y^2$
- $3|x^5|y^2$
 - $9|x^{25}|y^4$
 - $9x^{25}|y^4|$
 - $3x^5|y^2|$

C

2. $\sqrt[3]{27x^{15}y^{24}}$
- $3x^5|y^8|$
 - $9x^{15}|y^{24}|$
 - $3x^5y^8$
 - $9|x^{15}|y^{24}$

C

3. The formula for the volume of a sphere is $V = \frac{4}{3}\pi r^3$. Find the radius, to the nearest hundredth, of a sphere with a volume of 15 in.³.
- 3.58 in.
 - 258.01 in.
 - 1.53 in.
 - 1.85 in.

$$3 \cdot 15 = \frac{4}{3}\pi r^3$$

$$\frac{45}{4\pi} = \frac{4\pi r^3}{4\pi}$$

PCMPAS

$$\left(\frac{45}{4\pi}\right)^{\frac{1}{3}} = r^{\frac{3}{1} \cdot \frac{1}{3}}$$

$$1.53 = r$$

Multiply and simplify if possible.

A

4. $\sqrt{7x}(\sqrt{x} - 7\sqrt{7}) = \sqrt{7x^2} - 7\sqrt{49x}$
 $= x\sqrt{7} - 49\sqrt{x}$
- $x\sqrt{7} - 49\sqrt{x}$
 - $\sqrt{7x} - 49x$
 - $x\sqrt{7} - x\sqrt{49}$
 - $-\sqrt{42x}$

What is the simplest form of the product?

A

5. $\sqrt[3]{7x^7} \cdot \sqrt[3]{9x^4} = \sqrt[3]{63x^{11}} = \sqrt[3]{63(x^3)^3x^2} = x^3\sqrt[3]{63x^2}$
- $x^3 \cdot \sqrt[3]{63x^2}$
 - $\sqrt[3]{63x^{11}}$
 - $x^3 \cdot \sqrt[3]{63x^{11}}$
 - none of these

6. $\frac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}} = \frac{\sqrt[3]{3 \cdot 2 \cdot (x^6)^3 x}}{\sqrt[3]{3 \cdot 2 \cdot (x^6)^3 x}} = 3x^6 \sqrt[3]{2x}$

a. $2x \sqrt[3]{3x^6}$
 b. $3x^6 \sqrt[3]{2x}$
 c. $\sqrt[3]{135x^{19}}$
 d. $3x^6 \sqrt{135x}$

7. $\frac{\sqrt{6x^8y^9}}{\sqrt{5x^2y^4}} = \frac{\sqrt{6x^6y^5} \sqrt{5}}{\sqrt{5}} = \frac{\sqrt{30x^6y^5}}{5} = \frac{\sqrt{30(x^3)^2(y^3)^1 y}}{5} = \frac{x^3 y^2 \sqrt{30y}}{5}$

a. $\frac{x^3 y^2 \sqrt{30y}}{5}$
 b. $\frac{\sqrt{30x^{10}y^{13}}}{5x^2y^4}$
 c. $5x^3y^2 \sqrt{30y}$
 d. none of these

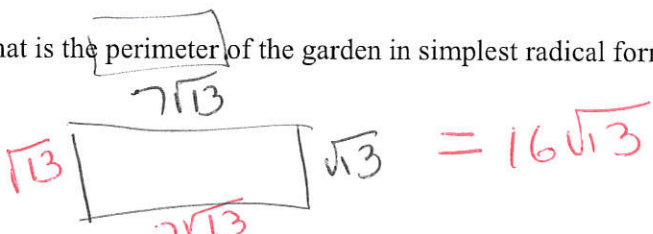
What is the simplest form of the radical expression?

8. $2^4 \sqrt{2x} + 6^4 \sqrt{2x} = 8^4 \sqrt{2x}$

a. $8^4 \sqrt{4x}$
 b. $16^4 \sqrt{2x}$
 c. $8^4 \sqrt{2x}$
 d. not possible to simplify

9. A garden has width $\sqrt{13}$ and length $7\sqrt{13}$. What is the perimeter of the garden in simplest radical form?

a. $14\sqrt{13}$ units
 b. $16\sqrt{13}$ units
 c. 91 units
 d. $8\sqrt{13}$ units



What is the simplest form of the expression?

10. $\sqrt[3]{48} + \sqrt[3]{2058} - \sqrt[3]{750} = \sqrt[3]{2^3 \cdot 6} + \sqrt[3]{7^3 \cdot 6} - \sqrt[3]{5^3 \cdot 6} = 2 \sqrt[3]{6} + 7 \sqrt[3]{6} - 5 \sqrt[3]{6} = 4 \sqrt[3]{6}$

a. $4 \sqrt[3]{6}$
 b. $14 \sqrt[3]{6}$
 c. $2.8 \sqrt[3]{6}$
 d. $9 \sqrt[3]{6}$

What is the product of the radical expression?

A 11. $(-5 - \sqrt{3})^2 (-5 - \sqrt{3}) = 25 + 5\sqrt{3} + 5\sqrt{3} + 3 = 28 + 10\sqrt{3}$

a. $28 + 10\sqrt{3}$
 b. $28 - 10\sqrt{3}$
 c. $-13 + 5\sqrt{3}$
 d. $25 - 10\sqrt{3}$

A 12. $(5 - \sqrt{2})(5 + \sqrt{2}) = 25 + 5\sqrt{2} - 5\sqrt{2} - 2 = 23$

a. 23
 b. 20
 c. 27
 d. 18

Simplify.

C 13. $20^{\frac{1}{2}} \cdot 20^{\frac{1}{2}} = 20^{\frac{1}{2} + \frac{1}{2}} = 20^1 = 20$

a. $20^{\frac{1}{4}}$ b. $\sqrt{20}$ c. 20 d. 1

B 14. $16^{\frac{1}{2}} = (\sqrt{16})^1 = 4$

a. 16^2 b. 4 c. $\sqrt{16^2}$ d. 16

A 15. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

a. $\sqrt[8]{3x^3}$ b. $\sqrt[8]{3x^3}$ c. $\sqrt[3]{x^8}$ d. $\sqrt[3]{8x^3}$

no parenthesis

$\sqrt[n]{x^m} = x^{\frac{m}{n}}$

A 16. Write $(8a^{-3})^{-\frac{2}{3}}$ in simplest form.

a. $\frac{a^2}{4}$ b. $4a^2$ c. $\frac{1}{4a^2}$ d. none of these

$(a^m)^n = a^{mn}$
 $(\sqrt[3]{8})^2 = \frac{a^2}{4}$

What is the solution of the equation?

B 17. $-10 + \sqrt{x+8} = -4$

a. 36 b. 28 c. -2 d. 44

$\sqrt{x+8} = 6$
 $x+8 = 36$
 $x = 28$

18. $4(3-x)^{\frac{4}{3}} - 5 = 59$
- 5, 11
 - 5
 - 11
 - 11

$$4(3-x)^{\frac{4}{3}} - 5 = 59$$

$$\frac{4(3-x)^{\frac{4}{3}}}{4} = \frac{64}{4}$$

$$(3-x)^{\frac{4}{3} \cdot \frac{3}{4}} = \frac{16}{4^{\frac{3}{4}}}$$

$$3-x = \sqrt[3]{16}$$

$$3-x = \pm(2)^3$$

$$3-x = \pm 8$$

$$\oplus \rightarrow 3-x = 8$$

$$-x = 5$$

$$x = -5$$

$$\ominus \rightarrow 3-x = -8$$

$$-x = -11$$

$$x = 11$$

What is the solution of the equation? Eliminate any extraneous solutions.

19. $\sqrt{3x+28} - 8 = x$
- 9
 - 9 and -4
 - 4
 - 9 and -4

$$\sqrt{3x+28} = (x+8)$$

$$3x+28 = (x+8)(x+8)$$

$$3x+28 = x^2 + 8x + 8x + 64$$

$$3x+28 = x^2 + 16x + 64$$

$$0 = x^2 + 13x + 36$$

$$0 = (x+9)(x+4)$$

$$x = -9, -4$$

20. Let $f(x) = x + 2$ and $g(x) = x^2$. Find $(g \circ f)(-5)$.
- 9
 - 3
 - 49
 - 10

$$= g(f(-5))$$

$$= g((-5)+2) = g(-3) = 9$$

21. You have a coupon good for \$6 off the price of any large pizza. You also get a 20% discount on any pizza if you show your student ID. How much more would you pay for a large pizza if the cashier applies the coupon first?
- \$1.50
 - \$0.00
 - \$1.20
 - \$.50

$$f(x) = x - 6$$

$$g(x) = .8x$$

$$g(f(x)) - f(g(x))$$

$$[g(x-6)] - [f(.8x)]$$

$$[.8(x-6)] - [.8x - 6]$$

What is the inverse of the given relation?

$$[.8x - 4.8] - [.8x - 6]$$

$$-4.8 + 6 = \$1.20$$

22. $y = 7x^2 - 3$
- $y = \pm \sqrt{\frac{x+3}{7}}$
 - $x = \sqrt{\frac{y+3}{7}}$
 - $y^2 = \frac{x-3}{7}$
 - $y = \pm \sqrt{\frac{x-3}{7}}$

$$x = 7y^2 - 3$$

$$x+3 = 7y^2$$

$$\frac{x+3}{7} = \frac{7y^2}{7}$$

$$\sqrt{y^2} = \pm \sqrt{\frac{x+3}{7}}$$

23. $y = 3x + 9$

a. $y = \frac{1}{3}x + 3$

b. $y = 3x - 3$

c. $y = 3x + 3$

d. $y = \frac{1}{3}x - 3$

$x = 3y + 9$

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

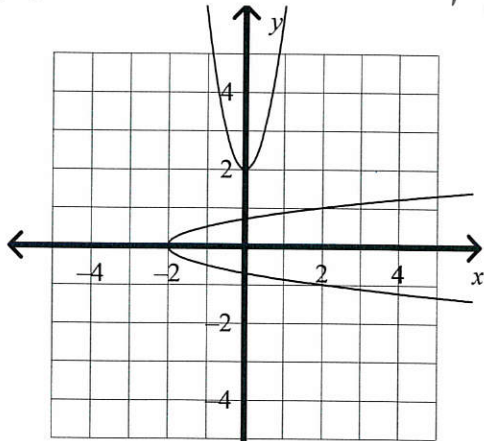
$y = \frac{1}{3}x - 3$

B

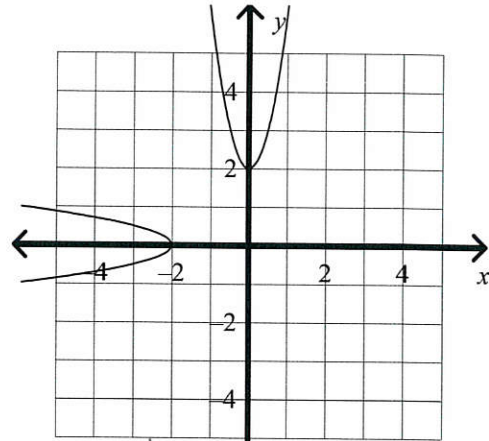
24. Graph $y = -4x^2 - 2$ and its inverse.

$y = -4(x-0)^2 - 2$

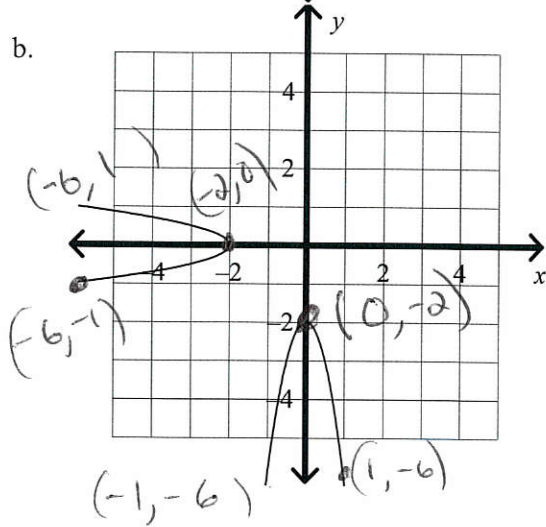
a.



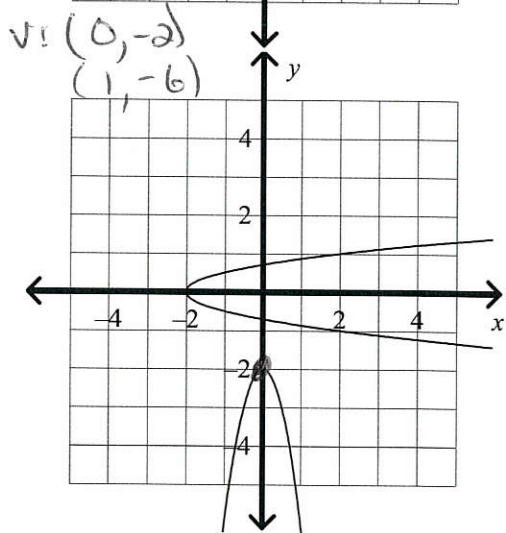
c.



b.



d.

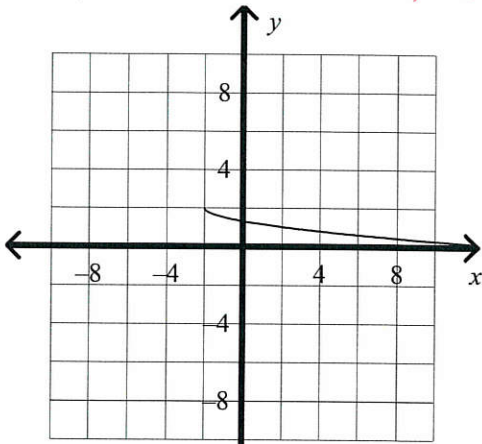


25. $y = -0.5\sqrt{x-2} + 2$

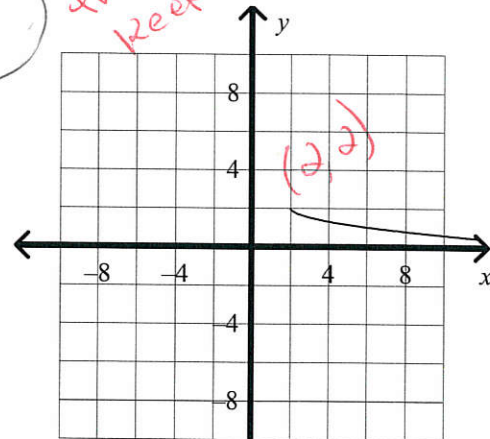
$V: (2, 2)$

change the sign; sign.
keep the sign.

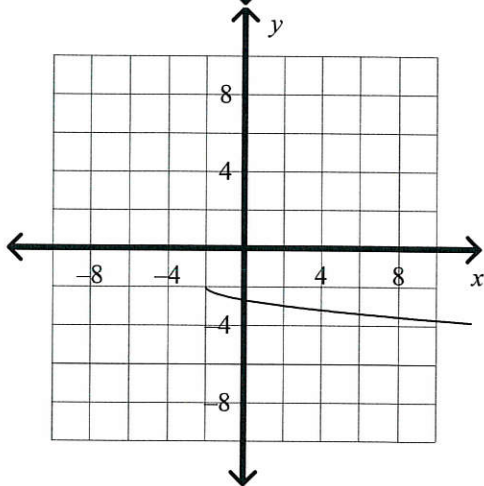
a.



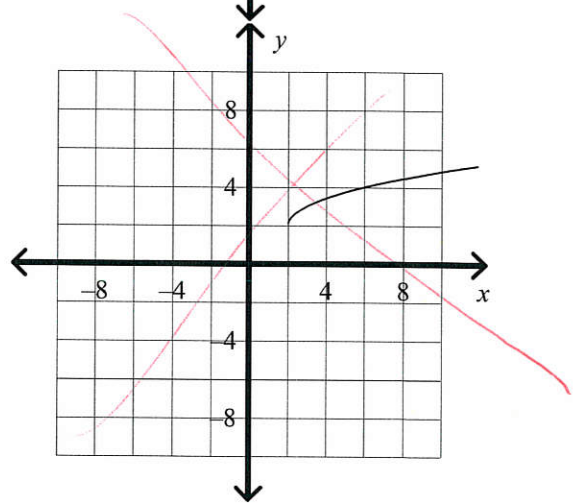
c.



b.



d.



Chapter 6 REVIEW
Answer Section**MULTIPLE CHOICE**

- | | |
|------------|---|
| 1. ANS: A | OBJ: 6-1.1 To find nth roots |
| 2. ANS: C | OBJ: 6-1.1 To find nth roots |
| 3. ANS: C | OBJ: 6-1.1 To find nth roots |
| 4. ANS: A | OBJ: 6-2.1 To multiply and divide radical expressions |
| 5. ANS: A | OBJ: 6-2.1 To multiply and divide radical expressions |
| 6. ANS: B | OBJ: 6-2.1 To multiply and divide radical expressions |
| 7. ANS: A | OBJ: 6-2.1 To multiply and divide radical expressions |
| 8. ANS: C | OBJ: 6-3.1 To add and subtract radical expressions |
| 9. ANS: B | OBJ: 6-3.1 To add and subtract radical expressions |
| 10. ANS: A | OBJ: 6-3.1 To add and subtract radical expressions |
| 11. ANS: A | OBJ: 6-3.1 To add and subtract radical expressions |
| 12. ANS: A | OBJ: 6-3.1 To add and subtract radical expressions |
| 13. ANS: C | OBJ: 6-4.1 To simplify expressions with rational exponents |
| 14. ANS: B | OBJ: 6-4.1 To simplify expressions with rational exponents |
| 15. ANS: A | OBJ: 6-4.1 To simplify expressions with rational exponents |
| 16. ANS: A | OBJ: 6-4.1 To simplify expressions with rational exponents |
| 17. ANS: B | OBJ: 6-5.1 To solve square root and other radical equations |
| 18. ANS: A | OBJ: 6-5.1 To solve square root and other radical equations |
| 19. ANS: C | OBJ: 6-5.1 To solve square root and other radical equations |
| 20. ANS: A | OBJ: 6-6.2 To find the composite of two functions |
| 21. ANS: C | OBJ: 6-6.2 To find the composite of two functions |
| 22. ANS: A | OBJ: 6-7.1 To find the inverse of a relation or function |
| 23. ANS: D | OBJ: 6-7.1 To find the inverse of a relation or function |
| 24. ANS: B | OBJ: 6-7.1 To find the inverse of a relation or function |
| 25. ANS: C | OBJ: 6-8.1 To graph square root and other radical functions |