

## T11 Partial Review

Write each expression in radical form.

1)  $(2v)^{\frac{5}{3}}$

2)  $x^{\frac{5}{2}}$

3)  $(3v)^{\frac{1}{3}}$

4)  $(7x^2)^{\frac{1}{3}}$

Write each expression in exponential form.

5)  $\sqrt{x}$

6)  $\sqrt[5]{2x^2}$

7)  $\sqrt[4]{10n}$

8)  $\sqrt[3]{4n}$

Simplify.

9)  $(64x^6)^{\frac{3}{2}}$

10)  $(9n^4)^{\frac{1}{2}}$

11)  $(n^4)^{\frac{3}{2}}$

12)  $(216p^3)^{\frac{4}{3}}$

13)  $(r^8)^{\frac{1}{2}}$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

14)  $2x^{\frac{5}{4}}y^{-\frac{7}{4}} \cdot 2x^{-2}y^{\frac{4}{3}}$

15)  $3m^{-1}n^{\frac{5}{3}} \cdot 3m^2n^{\frac{5}{4}}$

16)  $4u^{-\frac{1}{2}}v^{-\frac{4}{3}} \cdot u^{\frac{3}{4}}$

17)  $\left(x^{-\frac{1}{3}}y^2\right)^{\frac{4}{3}}$

18)  $\left(x^{-\frac{5}{4}}y^{-1}\right)^{\frac{2}{3}}$

19)  $\left(x^{\frac{5}{4}}y^{-\frac{1}{2}}\right)^{\frac{1}{2}}$

20)  $\frac{yx^{-2}z^2}{x^2}$

21)  $\frac{jh^{-1}}{4h^{\frac{1}{2}}j^{\frac{2}{3}}k^{\frac{1}{2}}}$

22)  $\frac{3a^{-1}c^2}{3ca^{\frac{1}{2}}}$

23)  $\frac{\left(\frac{1}{n^4}\right)^{\frac{7}{4}} \cdot n^{\frac{3}{2}}}{n^2}$

24)  $\frac{r^{\frac{4}{3}}r^2}{r^{-1}}$

Simplify. Your answer should contain only positive exponents.

25)  $\frac{2^4}{(2^3 \cdot 2^2)^{-2}}$

26)  $\frac{2^2}{(2^2)^{-2} \cdot 2^{-2}}$

27)  $\frac{2^{-2} \cdot 2^{-3}}{(2^2)^3}$

28)  $\frac{2^{-4} \cdot 2^4}{(2^3)^4}$

# Review

*Simplify*

Evaluate the expression. Tell which properties of exponents you used.

1.  $2^5 \cdot 2^3$

2.  $(-7)^2(-7)$

3.  $4^{-6} \cdot 4^{-1}$

4.  $(5^{-2})^2$

5.  $\frac{4^{-7}}{4^{-3}}$

6.  $\frac{8^{-4}}{8^2}$

7.  $\left(\frac{2}{3}\right)^3$

8.  $\left(\frac{4}{5}\right)^{-3}$

Simplify the expression. Tell which properties of exponents you used.

18.  $\frac{x^8}{x^4}$

19.  $\frac{y^4}{y^{-7}}$

20.  $(3^2 5^3)^6$

21.  $(4^0 w^2)^{-5}$

22.  $(y^4 z^2)(y^{-3} z^{-5})$

23.  $(2m^3 n^{-1})(8m^4 n^{-2})$

24.  $(7c^7 d^2)^{-2}$

25.  $(5g^4 h^{-3})^{-3}$

26.  $\frac{x^5 y^{-8}}{x^5 y^{-6}}$

27.  $\frac{16q^0 r^{-6}}{4q^{-3} r^{-7}}$

28.  $\frac{12a^{-3} b^9}{21a^2 b^{-5}}$

29.  $\frac{8e^{-4} f^{-2}}{18ef^{-5}}$

Rewrite the expression using rational exponent notation.

1.  $\sqrt[3]{7}$

2.  $(\sqrt[3]{6})^2$

3.  $(\sqrt[5]{14})^4$

4.  $(\sqrt[7]{-21})^3$

5.  $(\sqrt[8]{11})^7$

6.  $(\sqrt[9]{-2})^4$

Rewrite the expression using radical notation.

7.  $17^{1/3}$

8.  $44^{1/6}$

9.  $33^{2/3}$

10.  $9^{5/3}$

11.  $(-28)^{7/5}$

12.  $39^{4/7}$

*Numerical Answer*  
Evaluate the expression without using a calculator.

13.  $(\sqrt[3]{8})^2$

14.  $(\sqrt[4]{16})^3$

15.  $(\sqrt[4]{81})^4$

16.  $36^{3/2}$

17.  $4^{5/2}$

18.  $27^{2/3}$

19.  $125^{4/3}$

20.  $(-8)^{1/3}$

21.  $(-32)^{3/5}$

Evaluate the expression using a calculator. Round the result to two decimal places when appropriate.

22.  $\sqrt[3]{38}$

23.  $\sqrt[6]{112}$

24.  $\sqrt[7]{-215}$

25.  $(241)^{1/5}$

26.  $(-133)^{1/3}$

27.  $(69)^{1/4}$

28.  $(96)^{2/3}$

29.  $(356)^{5/9}$

30.  $(-2427)^{4/7}$

**Simplify the expression using the properties of radicals and rational exponents.**

- |  |  |  |
|--|--|--|
| 1. $7^{1/3} \cdot 7^{4/3}$             | 2. $\frac{4^{2/3}}{4^{1/3}}$           | 3. $(6^{2/3})^{3/4}$                   |
| 4. $5^{1/4} \cdot 3^{1/4}$             | 5. $\sqrt[4]{2} \cdot \sqrt[4]{8}$     | 6. $\frac{\sqrt[4]{192}}{\sqrt[4]{6}}$ |
| 7. $\frac{11}{\sqrt[4]{11}}$           | 8. $\sqrt[3]{7} \cdot \sqrt[3]{49}$    | 9. $(3^{3/2})^2$                       |
| 10. $\left(\frac{54}{64}\right)^{1/3}$ | 11. $\frac{\sqrt[4]{32}}{\sqrt[4]{2}}$ | 12. $\frac{\sqrt[5]{5}}{\sqrt[5]{27}}$ |

**Simplify the expression. Assume all variables are positive.**

- |   |  |   |
|---|--|---|
| 13. $x^{5/3} \cdot x^{4/3}$             | 14. $\sqrt{x^{2/5}}$                       | 15. $(x^{1/2})^{2/7}$                       |
| 16. $\left(\frac{x^2}{27}\right)^{1/3}$ | 17. $\sqrt[3]{16x^4}$                      | 18. $(x^{-3})^{2/5}$                        |
| 19. $\frac{x^{7/5}}{x^{4/5}}$           | 20. $\frac{\sqrt[3]{64x^3y}}{4x^{-3}y}$    | 21. $x^5 \cdot x^{\sqrt{3}}$                |
| 22. $(x^{\sqrt{2}})^{3\sqrt{2}}$        | 23. $\frac{x^{4\sqrt{3}}}{2x^{2\sqrt{3}}}$ | 24. $(\sqrt[3]{x^4} \cdot \sqrt{x^5})^{-2}$ |

**Perform the indicated operation. Assume all variables are positive.**

- |   |                                    |
|---|------------------------------------|
| 25. $6\sqrt[3]{5} + 2\sqrt[3]{5}$         | 26. $5\sqrt{5} - \sqrt{45}$        |
| 27. $2\sqrt{27} - 3\sqrt{48}$             | 28. $2\sqrt{x} + 7\sqrt{x}$        |
| 29. $3(x^{1/2}y^3)^2 - (x^3y^{18})^{1/3}$ | 30. $4x^{\sqrt{3}} + x^{\sqrt{3}}$ |

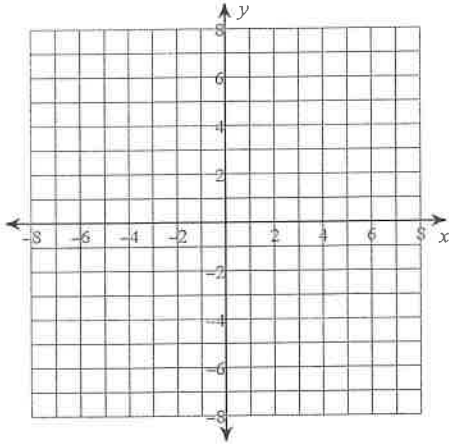
**Write the expression in simplest form. Assume all variables are positive.**

- |                            |   |   |
|----------------------------|---|---|
| 31. $\sqrt[4]{3x^7y^9z^3}$ | 32. $\sqrt{x^3y^4z} \cdot \sqrt{xyz^4}$ | 33. $\sqrt[3]{\frac{81x^2y^3}{8xy^4z}}$ |
|----------------------------|---|---|

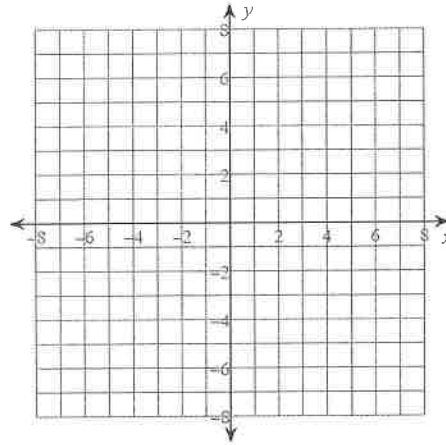
## Extra Practice Graphing Cube Root and Cubic Functions

Sketch the graph of each function.

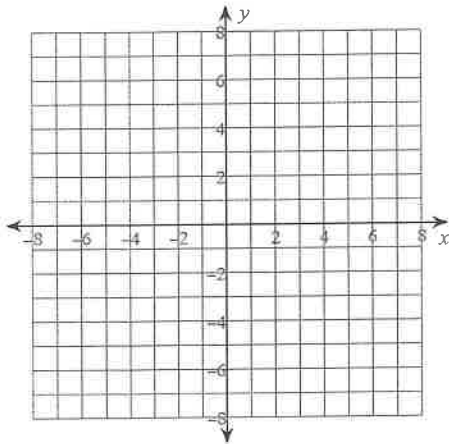
1)  $y = \frac{1}{2}\sqrt[3]{x+1}$



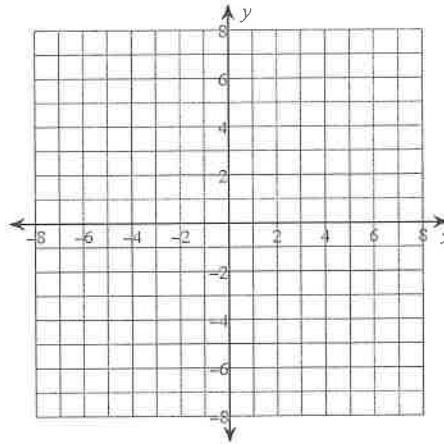
2)  $y = 2\sqrt[3]{x-3}$



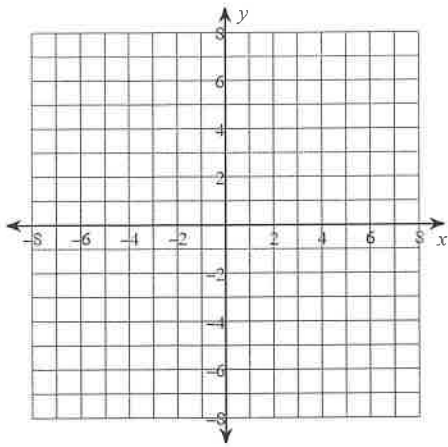
3)  $y = \sqrt[3]{x+1}$



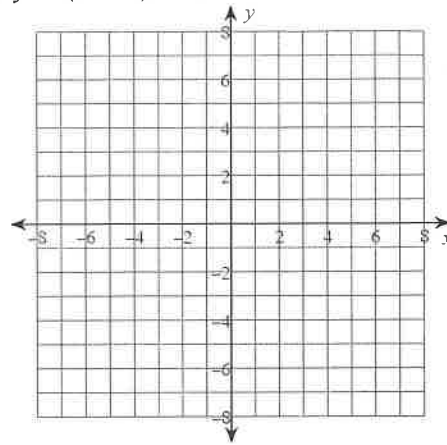
4)  $y = \sqrt[3]{x-1} - 2$



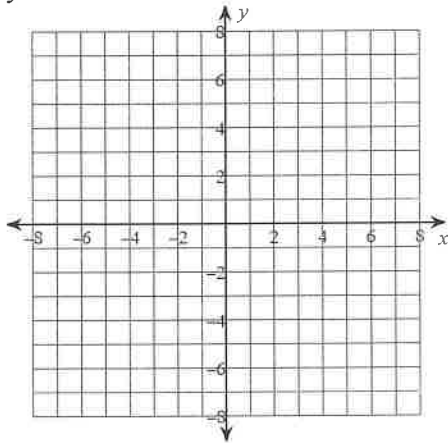
$$5) y = -2 + 2\sqrt[3]{x+2}$$



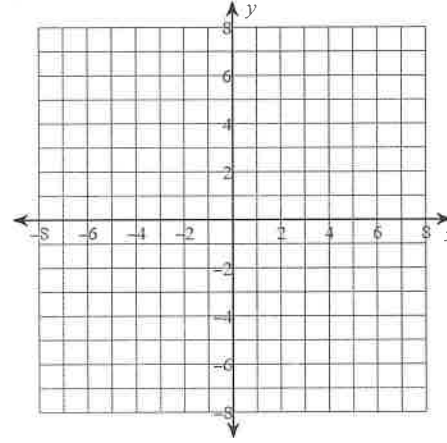
$$6) y = (x-2)^3 + 1$$



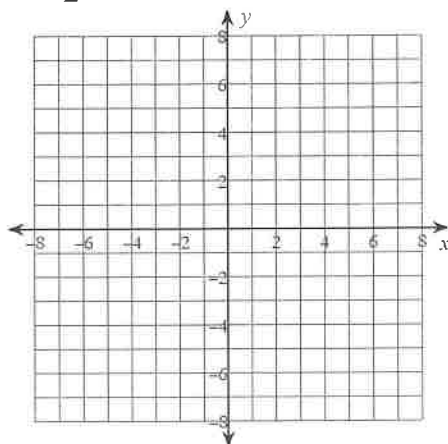
$$7) y = 2x^3 - 1$$



$$8) y = -(x+2)^3$$



$$9) y = \frac{1}{2}x^3 + 3$$



$$10) y = 2(x+4)^3 - 2$$

