GO COUGARS!

Warm Up Simplify, so that all exponents are positive.

1) $\dfrac{\left(8x^{-3}y^{5}\right)^{2}}{x^{6}y}$ $= \dfrac{8^{2}x^{-6}y^{10}}{x^{6}y}$ $\dfrac{64y^{9}}{x^{12}}$ $\dfrac{64y^{11}}{x^{12}}$

2) $\left(-2x^{-5}y^{3}\right)^{-3}$ $= \dfrac{x^{15}}{-8y^{9}}$ $-2^{-3}x^{15}y^{-9}$ $= \dfrac{x^{15}}{-2^{3}y^{9}}$

3) $\sqrt[3]{-64a^{42}}$ $\sqrt[3]{-64}\cdot\sqrt[3]{a^{42}}$ $-4a^{14}$

4) $\sqrt{81c^{24}d^{64}}$ $-9c^{12}d^{32}$

5) $\sqrt[4]{16x^{36}y^{48}}$ $2x^{9}y^{12}$

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Simplify completely. Compare your answer with a person sitting next to you.

$\sqrt{18x^{13}}$

A $2\sqrt{3x^{13}}$

B $3\sqrt{2x^{13}}$

C $2x^{6}\sqrt{3x}$

D $3x^{6}\sqrt{2x}$

$\sqrt{18}$ $\sqrt{x^{13}}$ $13/2$ 6

$9\cdot 2$ $3\cdot 3\cdot 2$

$3\sqrt{2}\,x^{6}\sqrt{x}$

$3x^{6}\sqrt{2x}$

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

$\frac{3}{4}\left(10^{3}=\frac{4}{3}\pi r^{3}\right)\frac{3}{4}$

$\frac{1}{\pi}\left(\frac{30}{4}=\pi r^{3}\right)\frac{1}{\pi}$

$\sqrt[3]{\frac{30}{4\pi}}=\sqrt[3]{r^{3}}$

$1.3=r$

$\sqrt[4]{.0016}=.2$

$\sqrt{(x+y)^{4}}=(x+y)^{2}$

$\sqrt{x^{4}}=x^{2}$

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Perfect Cubes

1, 8, 27, 64, 125

Powers of 4 1 16 81 256 625

perfect squares 1-15

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Answers for Lesson 7-1 Exercises

1. $15, -15$
2. $0.07, -0.07$
3. none
4. $\frac{8}{13}, -\frac{8}{13}$
5. -4
6. 0.5
7. $-\frac{1}{2}$
8. 0.07
9. $2, -2$
10. none
11. $0.3, -0.3$
12. $\frac{10}{3}, -\frac{10}{3}$
13. 6
14. -6
15. no real-number root
16. 0.6
17. -4
18. -4
19. -3
20. no real-number root
21. $4|x|$
22. $0.5|x^3|$
23. $x^4|y^9|$
24. $8b^{24}$
25. $-4a$
26. $3y^2$
27. $x^2|y^3|$
28. $2y^2$
29. 1.34 in.
30. 1.68 ft
31. 0.48 cm
32. 0.08 mm
33. $10, -10$
34. $1, -1$
35. $0.5, -0.5$
36. $\frac{2}{3}, -\frac{2}{3}$
37. $\sqrt[3]{-64}, \sqrt[6]{64}, -\sqrt[3]{-64}, \sqrt{64}$
38. a. ≈35 ft
    b. ≈20 ft longer
39. 0.5
40. $\frac{1}{3}$
41. 0.2
42. $\frac{1}{4}$
43. $2|c|$
44. $3xy^2\sqrt[3]{3}$
45. $12y^2z^2|x|\sqrt{xy}$
46. y^4
47. $-y^4$
48. k^3
49. $-k^3$
51. $(x+1)^2$
53. x^2

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7.2 Multiplying and Dividing Radical Expressions

Objective:
to understand and correctly apply the rules for multiplying and dividing radical expression

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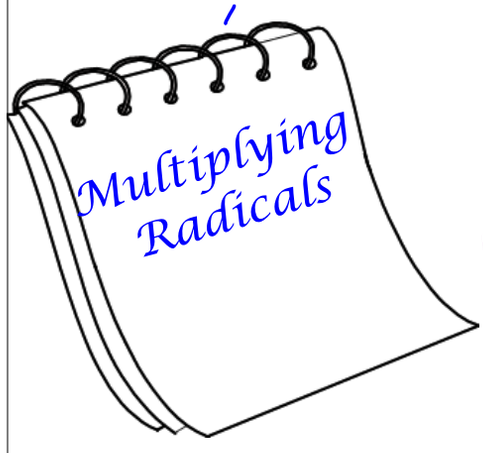
7.2 Multiplying and Dividing Radical Expressions

$\sqrt{9} \cdot \sqrt{4} =$ $3 \cdot 2 = 6$

same as..... $\sqrt{9 \cdot 4} = \sqrt{36} = 6$



1) $\sqrt{2} \cdot \sqrt{8} = \sqrt{2 \cdot 8} = \sqrt{16} = 4$

2) $\sqrt[3]{-16} \cdot \sqrt[3]{4} = \sqrt[3]{-16 \cdot 4} = \sqrt[3]{-64} = -4$

3) $\sqrt[4]{4} \cdot \sqrt[4]{-4} =$

$\sqrt[4]{4 \cdot -4} = \sqrt[4]{-16}$ = can't simplify

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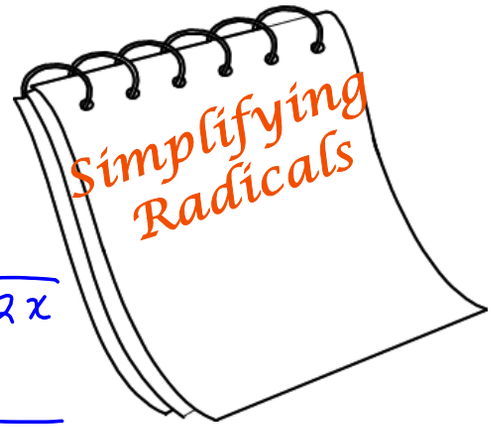
Simplify:



4) $\sqrt{50x^5}$

$\sqrt{50}$ $\sqrt{x^5}$ $= 5x^2\sqrt{2x}$

$25 \cdot 2$

5) $\sqrt[3]{24x^{32}}$ $= 2x^{10}\sqrt[3]{3x^2}$

$8 \cdot 3$

6) $4\sqrt[3]{54n^8}$ $4(3n^2\sqrt[3]{2n^2})$

$27 \cdot 2$ $12n^2\sqrt[3]{2n^2}$

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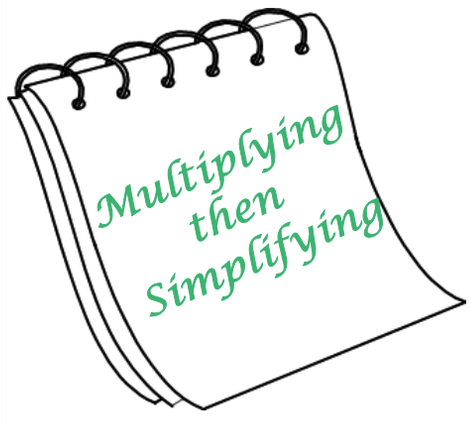

7) $\sqrt[3]{25xy^8} \cdot \sqrt[3]{5x^4y^3}$

$\sqrt[3]{25 \cdot 5\, x^5 y^{11}}$

$5 \cdot 5 \cdot 5$

$5xy^3\sqrt[3]{x^2y^2}$

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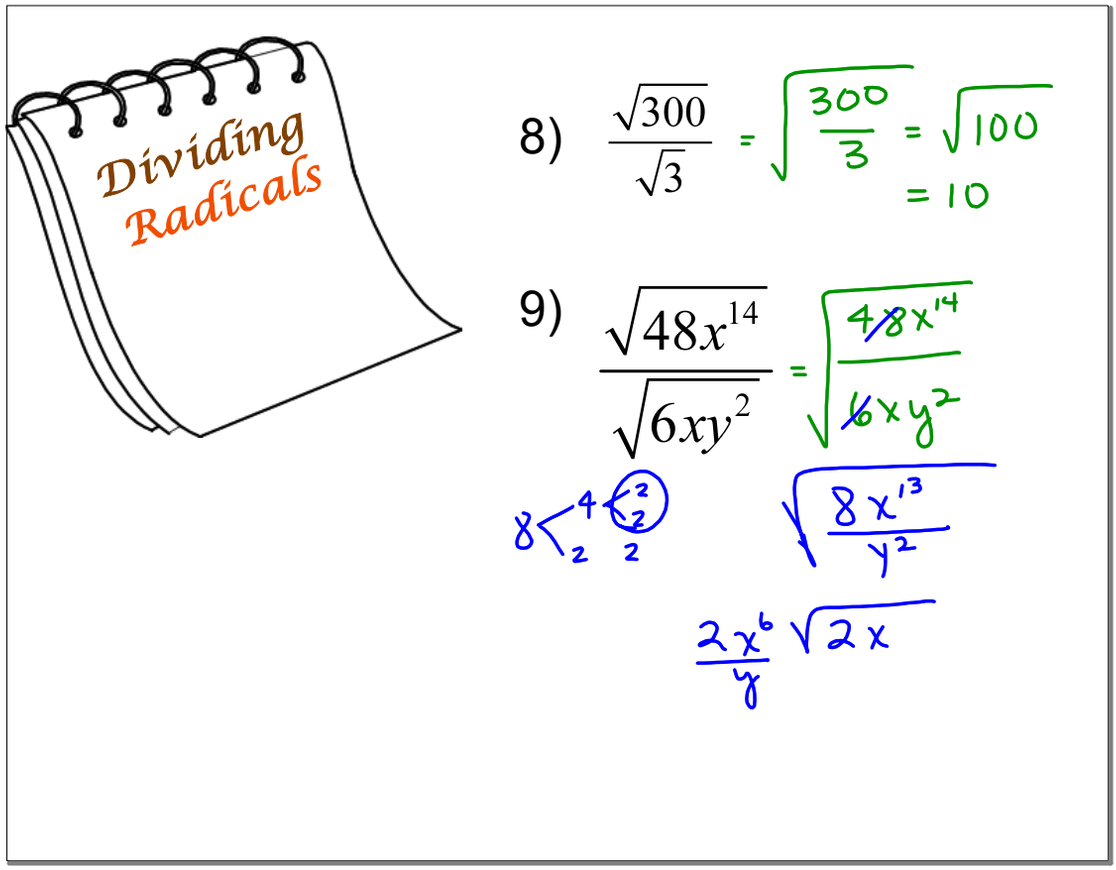

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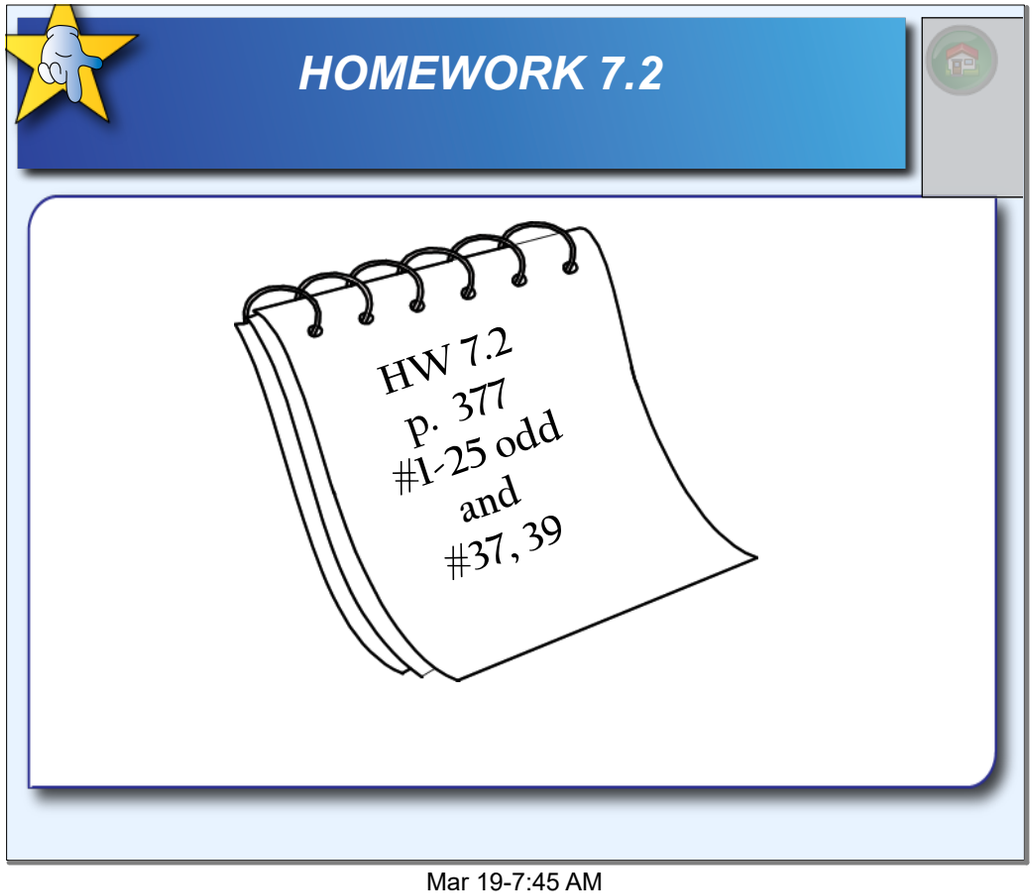

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e by Example

Example 1 (page 374)

Multiply, if possible. Then simplify.

1. $\sqrt{8} \cdot \sqrt{32}$
2. $\sqrt[3]{4} \cdot \sqrt[3]{16}$
3. $\sqrt[3]{9} \cdot \sqrt[3]{-81}$
4. $\sqrt[4]{8} \cdot \sqrt[4]{32}$
5. $\sqrt{-5} \cdot \sqrt{5}$
6. $\sqrt[3]{-5} \cdot \sqrt[3]{-25}$
7. $\sqrt[3]{9} \cdot \sqrt[3]{-24}$
8. $\sqrt[3]{-12} \cdot \sqrt[3]{-18}$

Example 2 (page 375)

Simplify. Assume that all variables are positive.

9. $\sqrt{20x^3}$
10. $\sqrt[3]{81x^2}$
11. $\sqrt{50x^5}$
12. $\sqrt[3]{32a^5}$
13. $\sqrt[3]{54y^{10}}$
14. $\sqrt{200a^6b^7}$
15. $\sqrt[3]{-250x^6y^5}$
16. $\sqrt[4]{64x^3y^6}$

Example 3 (page 375)

Multiply and simplify. Assume that all variables are positive.

17. $\sqrt[3]{6} \cdot \sqrt[3]{16}$
18. $\sqrt{8y^5} \cdot \sqrt{40y^2}$
19. $\sqrt{7x^5} \cdot \sqrt{42xy^9}$
20. $4\sqrt{2x} \cdot 5\sqrt{6xy^2}$
21. $3\sqrt[3]{5y^3} \cdot 2\sqrt[3]{50y^4}$
22. $-\sqrt[3]{2x^2y^2} \cdot 2\sqrt[3]{15x^5y}$

Example 4 (page 376)

Divide and simplify. Assume that all variables are positive.

23. $\frac{\sqrt{500}}{\sqrt{5}}$
24. $\frac{\sqrt{48x^3}}{\sqrt{3xy^2}}$
25. $\frac{\sqrt{56x^5y^5}}{\sqrt{7xy}}$
26. $\frac{\sqrt[3]{250x^7y^3}}{\sqrt[3]{2x^2y}}$

Example 5 (page 376)

Rationalize the denominator of each expression. Assume that all variables are positive.

27. $\frac{\sqrt{x}}{\sqrt{2}}$
28. $\frac{\sqrt{5}}{\sqrt{8x}}$
29. $\frac{\sqrt[3]{x}}{\sqrt[3]{2}}$
30. $\sqrt[3]{\frac{5}{3x}}$
31. $\frac{\sqrt[4]{2}}{\sqrt[4]{5}}$
32. $\frac{15\sqrt{60x^5}}{3\sqrt{12x}}$
33. $\frac{\sqrt{3xy^2}}{\sqrt{5xy^3}}$
34. $\frac{\sqrt{5x^4y}}{\sqrt{2x^2y^3}}$

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