6.2 Multiplying and Dividing Radical Expressions **Algebra 2** **THOMPSON**

1) Multiply.

$\sqrt{5} \cdot \sqrt{6}$ Since both are under the radical we can multiply them together

$\sqrt{5} \cdot \sqrt{6} = \sqrt{30}$ (Type an exact answer, using radicals as needed.)

2) Multiply.

$\sqrt{3} \cdot \sqrt{5}$ Since both are under the radical we can multiply them together

$\sqrt{3} \cdot \sqrt{5} = \sqrt{15}$ (Type an exact answer, using radicals as needed.)

3) Multiply.

$\sqrt{3} \cdot \sqrt{7}$ Since both are under the radical we can multiply them together

$\sqrt{3} \cdot \sqrt{7} = \sqrt{21}$ (Type an exact answer, using radicals as needed.)

4) Simplify the product.

$\sqrt{8} \cdot \sqrt{32}$ Both under radical $\sqrt{8 \cdot 32} = \sqrt{256} = 16$

5) Simplify the product.

$\sqrt{2} \cdot \sqrt{8}$ Both under radical $\sqrt{2 \cdot 8} = \sqrt{16} = 4$

6) Multiply if possible. Then simplify.

$\sqrt[3]{36} \cdot \sqrt[3]{6}$ Both under radical $\sqrt[3]{36 \cdot 6} = \sqrt[3]{216} = 6$

7) Multiply if possible. Then simplify.

$\sqrt[3]{5} \cdot \sqrt[3]{25}$ Both under radical $\sqrt[3]{5 \cdot 25} = \sqrt[3]{125} = 5$

8) Simplify the expression.

$\sqrt[3]{-12} \cdot \sqrt[3]{-18}$ Both under radical $\sqrt[3]{(-12)(-18)} = \sqrt[3]{216} = 6$

9) Simplify the expression.

$\sqrt[3]{-32} \cdot \sqrt[3]{-2}$ Both under radical $\sqrt[3]{(-32)(-2)} = \sqrt[3]{64} = 4$

10) Divide and simplify.

$\frac{\sqrt{500}}{\sqrt{5}}$ Both under radical $\frac{\sqrt{500}}{\sqrt{5}} = \sqrt{\frac{500}{5}} = \sqrt{100} = 10$

11) Divide and simplify.

$\frac{\sqrt[4]{243}}{\sqrt[4]{3}}$ Both under radical $\frac{\sqrt[4]{243}}{\sqrt[4]{3}} = \sqrt[4]{\frac{243}{3}} = \sqrt[4]{81} = 3$

SQUARE ROOT: USE PERFECT SQUARES

$2^2=4$ $3^2=9$ $4^2=16$ $5^2=25$ $6^2=36$ $7^2=49$ .....

circled number in example is the red #s in the box above

12) Simplify the following expression.

$\sqrt{2}\left(\sqrt{2}+\sqrt{14}\right)$

Distribute $(\sqrt{2}\cdot\sqrt{2})+(\sqrt{2}\cdot\sqrt{14})=$ $2+\sqrt{28}=2+2\sqrt{7}$

square root

$4\cdot 7$

13) Simplify the following expression.

$\sqrt{2}\left(\sqrt{2}+\sqrt{10}\right)$

Distribute $(\sqrt{2}\cdot\sqrt{2})+(\sqrt{2}\cdot\sqrt{10})=$ $2+\sqrt{20}=2+2\sqrt{5}$

square root

$4\cdot 5$

14) Simplify the following expression.

$\sqrt{7}\left(\sqrt{7}+\sqrt{14}\right)$

Distribute $(\sqrt{7}\cdot\sqrt{7})+(\sqrt{7}\cdot\sqrt{14})=$ $7+\sqrt{98}=7+7\sqrt{2}$

square root

$49\cdot 2$

15) Simplify the following expression.

$\sqrt{7}\left(\sqrt{7}+\sqrt{21}\right)$

Distribute $(\sqrt{7}\cdot\sqrt{7})+(\sqrt{7}\cdot\sqrt{21})=$ $7+\sqrt{98}=7+7\sqrt{3}$

square root

$49\cdot 3$

More complex radical expressions

a.

$$\sqrt[3]{\frac{12x^2}{4x}} = \sqrt[3]{3x}$$

b.

Multiply together $\sqrt{100} = 10$

c.

Multiply together $\sqrt[3]{64} = 4$

d.

Multiply together $\sqrt[3]{64} = 4$

e.

Multiply together $\sqrt[3]{64} = 4$

f. 

PERFECT SQUARES 4, 9, 16, 25, 36, 49

Find what perfect square goes into 175

$$25 \cdot 7$$

$$\sqrt{175x^{11}}$$

25 comes out to 5 and 7 stays in

divide exponent by 2,
5 with 1 left over(1 stays in)

$$5x^5\sqrt{7x}$$

Another #7 

PERFECT SQUARES 4, 9, 16, 25, 36, 49

Find what perfect square goes into 20

$$4 \cdot 5$$

$$\sqrt{20x^5}$$

4 comes out to 2 and 5 stays in

divide exponent by 2,
2 with 1 left over(1 stays in)

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

g. 

PERFECT CUBES 8, 27, 64, 125

Find what perfect square goes into 81

$$27 \cdot 3$$

$$\sqrt[3]{-81x^6y^5}$$

27 comes out to 3 and 3 stays in

divide exponent by 3(root),
if leftovers, they stay in

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

h. 

PERFECT SQUARES 4, 9, 16, 25, 36, 49

Multiply: $\sqrt{24x^{11}}$
add exponents

Find what perfect square goes into 24

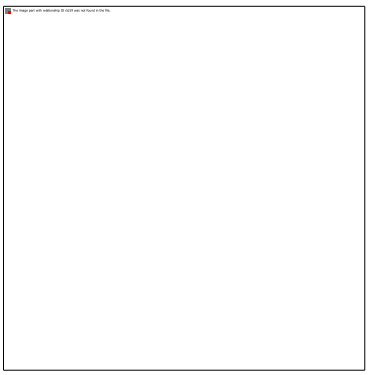
$$4 \cdot 6$$

$$\sqrt{24x^{11}}$$

divide exponent by 2 and one left over

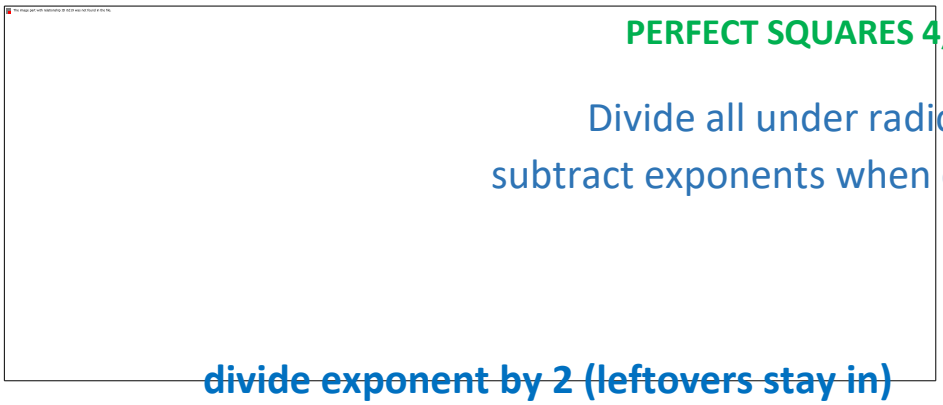
$$2x^5\sqrt{6x}$$

i.



$$\sqrt[3]{\frac{16}{2}} = \sqrt[3]{8}$$

j.



PERFECT SQUARES 4, 9, 16, 25, 36, 49

Divide all under radical $\sqrt{12x^5y}$

subtract exponents when dividing

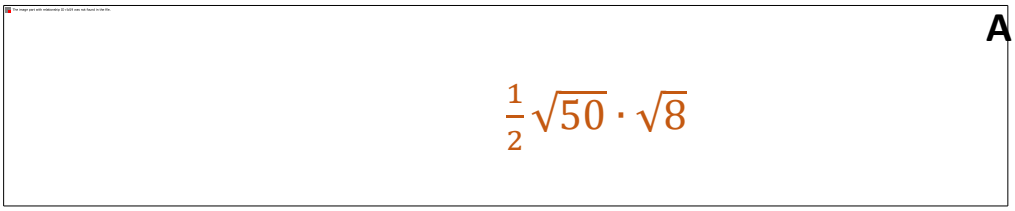
$\mathbf{4 \cdot 3}$

$\sqrt{\mathbf{12x^5y}}$

~~**divide exponent by 2 (leftovers stay in)**~~

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

k.



A = 1/2 bh

$$\frac{1}{2}\sqrt{50} \cdot \sqrt{8}$$