

OPERATIONS WITH
RADICALS
SECTION 12.2B



Combining using Multiplication/Division

□ Multiplication:

- Multiply “like” numbers together
 - Inside with inside
 - Outside with outside
- Distribute/FOIL as is needed
- Simplify

□ Division:

- Multiply both the top and bottom by the radical on the bottom (can't have a radical on the bottom)
- Simplify

Examples

□ 1.) $3\sqrt{5} \cdot 4\sqrt{2} =$

$12\sqrt{10}$

2.) $\sqrt{6} \cdot 4\sqrt{3} =$

$4 \cdot 3\sqrt{2} = 12\sqrt{2}$

$4\sqrt{18}$
 $2 \cdot 3 \cdot 3$

□ 3.) $\sqrt{3}(\sqrt{5} - 7) =$

$\sqrt{15} - 7\sqrt{3}$

4.) $\sqrt{2}(\sqrt{6} - \sqrt{3}) =$

$\sqrt{12} - \sqrt{6} = 2\sqrt{3} - \sqrt{6}$

$\sqrt{12} = 2\sqrt{3}$

Examples

$$(x+3)^2 = (x+3)(x+3)$$

$$x^2 + 3x + 3x + 9$$

5. $(2-\sqrt{5})^2$

$$(2-\sqrt{5})(2-\sqrt{5})$$

$$4 - 2\sqrt{5} - 2\sqrt{5} + \sqrt{25}$$

$$4 - 4\sqrt{5} + 5$$

$$\boxed{9 - 4\sqrt{5}}$$

6. $\frac{6}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{6\sqrt{5}}{\sqrt{25}} \boxed{\frac{6\sqrt{5}}{5}}$

Examples

□ 7. $\frac{3}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{3\sqrt{6}}{6}$

$$\boxed{\frac{\sqrt{6}}{2}}$$

□ 9. $\frac{\sqrt{3}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \boxed{\frac{\sqrt{15}}{5}}$

8. $\frac{4}{3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{4\sqrt{2}}{3 \cdot 2}$

$$\frac{4\sqrt{2}}{6} = \boxed{\frac{2\sqrt{2}}{3}}$$

Classwork

□ Pg 719 # 7-10, 12

Homework

□ Pg 719 # 31-41, 43