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# NOTES: Section 12.2 – Operations with Radical Expressions

Goals: #1 - I can add, subtract, multiply, and divide radical expressions.

*Homework: Section 12.2 Worksheet*

**Warm Up:**

1. Evaluate the function for the given value of $x$.
   a. $\sqrt{x-6}; 31$

2. Graph the function.
   State the domain and range.

   a. $y = \sqrt{x-4}$

| $x$ | $y$ |
|---|---|
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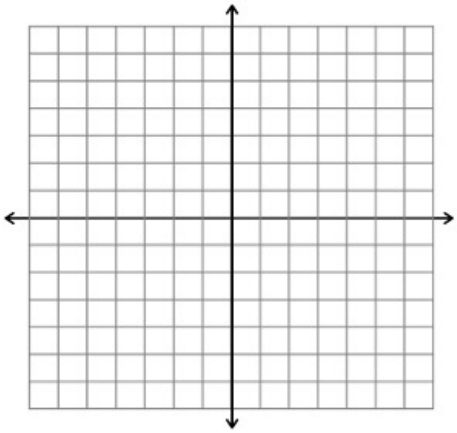

3. Find the domain of the function.

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

Domain:_____

Range _____

**Review:**

When we _____ radical expressions, we look for

_____ numbers.

**Example:** $\sqrt{32}$

**You practice:** Simplify the radical expression.

1. $\sqrt{40}$
2. $\sqrt{128}$
3. $\sqrt{300}$

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**Notes:**

To _____ radical expressions, we use the product property.

- _____: $\sqrt{a} \cdot \sqrt{b} = \sqrt{a \cdot b}$

**Example #1:** Simplify the radical expression.

1. $\sqrt{2} \cdot \sqrt{8}$
2. $\sqrt{2}(5 - \sqrt{3})$
3. $(2 + \sqrt{3})(2 - \sqrt{3})$

**You practice:** Simplify the radical expression.

1. $\sqrt{5}(\sqrt{2} + 1)$
2. $(6 - \sqrt{2})(6 + \sqrt{2})$
3. $\sqrt{3} \cdot \sqrt{12}$

**Notes:**

To _____ radical expressions, we use the qutioent property.

- _____: $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

Remember, we _____ have radicals in our _____.

We _____ the denomiator:

**Example:** $\frac{3}{\sqrt{5}}$

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**Example #2:** Simplify the radical expression.

1. $\frac{1}{\sqrt{3}}$
2. $\sqrt{\frac{10}{3}}$

**You practice:** Simplify the radical expression.

1. $\sqrt{\frac{3}{7}}$
2. $\frac{2}{\sqrt{2}}$

**Notes:**

To _____ or _____ radical expressions, we combine "like" terms.

**Example #3:** Simplify the radical expression.

1. $\sqrt{2} + 3\sqrt{2}$
2. $2\sqrt{2} + \sqrt{5} - 6\sqrt{2}$
3. $4\sqrt{3} - \sqrt{27}$

**You practice:** Simplify the radical expression.

1. $3\sqrt{5} - 2\sqrt{5}$
2. $\sqrt{18} + \sqrt{2}$
3. $\sqrt{7} + \sqrt{2} + 3\sqrt{7}$