

Name:

Date:

Unit 8, Day 3 Warm-up

Period:

Evaluate the following expression for $x = 7$, $y = 121$:

$$x^2 + 3\sqrt{y} - 12$$

$$7^2 + 3\sqrt{121} - 12 = 49 + 33 - 12 = 70$$

Find all the values of the range of the function $f(x) = 3x^2 + 2x - 1$, given the following domain: $\{-1, 3, \frac{2}{3}, 0\}$.

SELECT ALL CORRECT ANSWERS

$$f(-1) = 3(-1)^2 + 2(-1) - 1 = 0$$

$$f(3) = 3(3)^2 + 2(3) - 1 = 32$$

$$f(\frac{2}{3}) = 3(\frac{2}{3})^2 + 2(\frac{2}{3}) - 1 = \frac{5}{3}$$

$$f(0) = 3(0)^2 + 2(0) - 1 = -1$$

a.) $\frac{5}{3}$

e.) 0

b.) -1

f.) 7

c.) $\frac{3}{5}$

g.) 8

d.) 4

h.) 32

Simplify d^2d^8 .

$$d^{10}$$

Simplify: $\frac{20g^{-4}h^6}{4g^2h^{-8}}$

$$\frac{5h^{14}}{g^6}$$

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Unit 8, Day 3 Notes

Period:

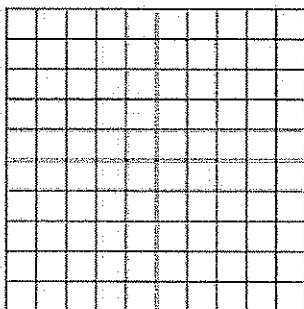


Learning Targets

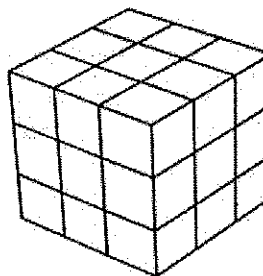
- I can simplify radicals with constants and variables.

Vocabulary (or properties or formulas)

Radical	Factors	Prime Numbers
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Perfect Square



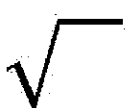
Perfect Cube

$$\sqrt{64} = 8$$

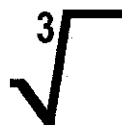
$$\sqrt[3]{72} = 8, 4, 8, 5$$

Radical: An expression that has root, such as square root or cube root.

Make sure to simplify the inside of the radical, constants and variables. To simplify: **FACTOR** the number and use **GROUPING** for factors and variables.



Means groups of TWO



Means groups of THREE

STEPS

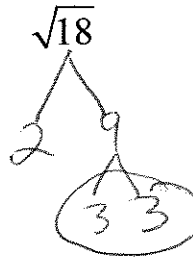
1. Use a factor tree to factor the number

2. Group your factors based on root number

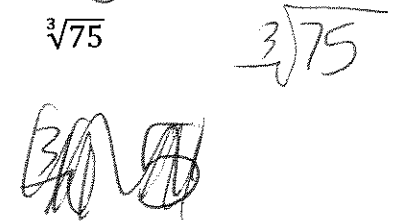
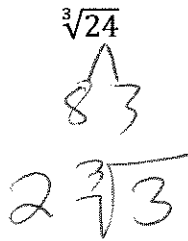
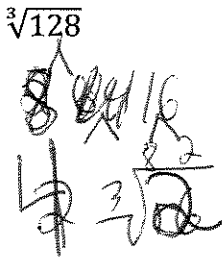
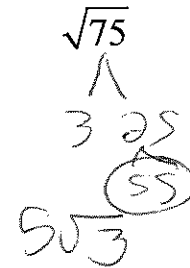
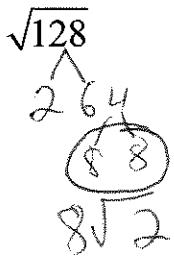
3. For each group, bring out one factor

4. Simplify the outside

EXAMPLE



$$3\sqrt{2}$$



What if it's already a perfect square? A perfect cube?

$$\sqrt{100} = 10$$

$$\sqrt[3]{27} = 3$$

What if there's letters inside the radical?

$$\sqrt{32y^3} = 4y\sqrt{2y}$$

$$\sqrt{80x^4y^9} = 4x^2y\sqrt{5y}$$

What if there are terms already outside the radical?

$$5\sqrt{72x^{11}} = 30x^5\sqrt{2x}$$

$$3\sqrt{28} = 6\sqrt{7}$$

$$2\sqrt{96x^7y^2} = 8x^3y\sqrt{6x}$$

$$5 \cdot 6x^5 \sqrt{2x} = 30x^5 \sqrt{2x}$$

$$3 \cdot 2\sqrt{7} = 6\sqrt{7}$$

$$8x^3y\sqrt{6x}$$

Name:

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Unit 8, Day 3 Practice

Period:



Learning Targets

- I can simplify radicals with constants and variables.

SPEED DATING/PARTNER PASS

Have kids make two columns of desks, where each column is made up of two desks facing each other. Each student should be sitting across from another student. Decide with side of each column is staying when the timer rings; the other side will move one desk down when the timer rings.

Give each student one of the problems below and start the timer (TBD by teacher). Each student will solve their problem on a separate sheet of paper. After they are done, they pass back their problem to their partner (across from them). When the timer rings, have students either stay or move (depending on what you decided). The new partners trade problems, reset the timer (about half of the original time), and the students do the new problems. Continue this rotation until all students have circulated back to their original seat, or until time is up.

Problems:

1. $\sqrt{4}$ 2	2. $\sqrt{16}$ 4	3. $-\sqrt{100}$ -10	4. $\sqrt{a^8}$ a^4	5. $\sqrt{w^{12}}$ w^6
6. $\sqrt{a^6b^{10}}$ a^3b^5	7. $\sqrt{9a^2}$ 3a	8. $-\sqrt{81m^{64}}$ $-9m^{32}$	9. $\sqrt{49a^4b^{12}}$ $7a^2b^6$	10. $\sqrt{121x^{14}y^6}$ $11x^7y^3$

11. $\sqrt{18}$ $3\sqrt{2}$	12. $\sqrt{125}$ $5\sqrt{5}$	13. $\sqrt{72}$ $6\sqrt{2}$	14. $\sqrt{180}$ $6\sqrt{5}$	15. $\sqrt{a^3}$ $a\sqrt{a}$
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Simplify completely:

1. $\sqrt{9} = 3$

2. $\sqrt{32}$
 $4\sqrt{2}$

3. $\sqrt{50}$
 $5\sqrt{2}$

4. $\sqrt{80}$
 $4\sqrt{5}$

5. ~~$\sqrt{72}$
 $6\sqrt{2}$~~ don't use

6. $\sqrt{120}$
 $4\sqrt{30}$

7. $\sqrt{68}$
 $2\sqrt{17}$

8. $\sqrt{200}$
 $10\sqrt{2}$

9. ~~$\sqrt{180}$~~ don't use

10. $\sqrt{33}$
 $\sqrt{33}$

11. $3\sqrt{12}$
 $3 \cdot 2\sqrt{3}$
 $6\sqrt{3}$

12. $5\sqrt{48}$
 $5 \cdot 4\sqrt{3}$
 $20\sqrt{3}$

13. $2\sqrt{76}$
 $2 \cdot 2\sqrt{19}$
 $4\sqrt{19}$

14. $-3\sqrt{32}$
 $-3 \cdot 2\sqrt{2}$
 $-6\sqrt{2}$

15. $5\sqrt{80}$
 $5 \cdot 4\sqrt{5}$
 $20\sqrt{5}$

Learning Target: I can simplify radicals with constants and variables.

U8 Practice/HW: Simplifying Radicals

To simplify a radical, **factor** the expression under the radical sign. For every group of **like factors**, bring out one of the factors. Multiply whatever is outside the sign, and then multiply whatever is inside the sign. Remember that for each group, you "bring out" **only one** of the numbers.

$\sqrt{4} = 2$ because 2 is a factor used twice ($2 \times 2 = 4$). $\sqrt{9} = 3$ because 3 is a factor used twice ($3 \times 3 = 9$)

$$\begin{array}{c} \sqrt{} \\ / \quad \backslash \\ 2 \quad 2 \end{array} \qquad \begin{array}{c} \sqrt{} \\ / \quad \backslash \\ 3 \quad 3 \end{array}$$

Examples:

$\sqrt{28}$ 7 4 7 (2 2) $2\sqrt{7}$	$\sqrt{54}$ 9 6 (3 3) 3 2 $3\sqrt{2 \times 3} = 3\sqrt{6}$	$\sqrt{150}$ 15 10 3 (5) 2 (5) $5\sqrt{3 \times 2} = 5\sqrt{6}$	$\sqrt{720}$ 72 10 9 8 2 5 (3 3) (2 2) (2 2) 5 $3 \cdot 2 \cdot 2\sqrt{5} = 12\sqrt{5}$
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Write in SIMPLEST FORM.

1. $\sqrt{4}$ 2	2. $3\sqrt{16}$ 12	3. $-\sqrt{100}$ -10	4. $\sqrt{a^8}$ a^4	5. $\sqrt{w^{12}}$ w^6
6. $\sqrt{121x^{14}y^6}$ $11x^7y^3$	7. $-\sqrt{81m^{64}}$ $-9m^{32}$	8. $\sqrt{18}$ $3\sqrt{2}$	9. $-2\sqrt{125}$ $-2 \cdot 5\sqrt{5}$ $-10\sqrt{5}$	10. $\sqrt{180}$ $6\sqrt{5}$
11. $4\sqrt{72}$ $4 \cdot 6\sqrt{2}$ $24\sqrt{2}$	12. $\sqrt{a^3}$ $a\sqrt{a}$	13. $\sqrt{75x^7y^5}$ $5x^3y^2\sqrt{3xy}$	14. $\sqrt{32a^7b^4}$ $4a^3b^2\sqrt{2a}$	15. $\sqrt{27a^{11}b^7}$ $3a^5b^3\sqrt{3ab}$

REMEMBER...

1.) Relationship A: Timmy can ride a bike for 20 miles 2 hours and he can ride his bike for 80 miles in 4 hours.

Relationship B: Julia types 3 pages in 39 minutes. She can also type 5 pages in 65 minutes.

$$\frac{2}{20} = \frac{4}{80} \quad \text{NO}$$

$$\frac{39}{3} = \frac{65}{5} \quad \text{YES}$$

~~g.) Only relationship A is a direct variation.~~

h.) Only relationship B is a direct variation.

~~j.) Both relationships are direct variations.~~

k.) Neither relationship is a direct variation.

2.) Find $g(-3)$ for $g(x) = -4x - 8$

$$-4(-3) - 8 = 4$$

Write your information as an ordered pair. (-3, 4)

3.) Find the range of $y = \frac{3}{4}x + 7$ for the given domain: $\{-8, 0, 2\}$

$$-8: \frac{3}{4}(-8) + 7 = 1$$

$$0: \frac{3}{4}(0) + 7$$

$$2: \frac{3}{4}(2) + 7 = \frac{17}{2}$$

Write as ordered pairs. (-8, 1), (0, 7), (2, $\frac{17}{2}$)

Name:

Unit 8, Day 3 Exit Ticket

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Period:

Learning Target: I can simplify radicals with constants and variables.

1. Simplify: $\sqrt{200x^3}$

$$\cancel{10} \times \sqrt{2x}$$

2. Simplify: $6\sqrt{64x^2y}$

$$6 \cdot 8\sqrt{y}$$
$$48\sqrt{y}$$

3. Select **all** expressions that are in simplest radical form:

a. $x^2y\sqrt{8y}$

b. $27y\sqrt{3x}$

c. $4\sqrt{7}$

d. $5\sqrt{3x^2y}$

e. $\sqrt{42}$

f. $\sqrt{32}$

