Unit 2

Square Roots, GCF, LCM, Laws of Exponents

$\sqrt{1} = 1$ $\sqrt{25} = 5$ $\sqrt{81} = 9$ $\sqrt{169} = 13$

$\sqrt{4} = 2$ $\sqrt{36} = 6$ $\sqrt{100} = 10$ $\sqrt{196} = 14$

$\sqrt{9} = 3$ $\sqrt{49} = 7$ $\sqrt{121} = 11$ $\sqrt{225} = 15$

$16 = 4$ $\sqrt{64} = 8$ $\sqrt{144} = 12$

Simplify

- Ex. 1)

$\sqrt{32}$

$5.7 =$ A.) $4\sqrt{2}$

22.6 B.) $16\sqrt{2}$

C.) 16

11.3 D.) $4\sqrt{8}$

$\sqrt{16}\ \sqrt{2}$

$4\sqrt{2}$

- Hit **2nd** **x^2**
- Enter 32 then hit **ENTER**
- Write the decimal by it.
- Continue to do this for A, B, C, and D to find the match.
- THERE MAY BE MORE THAN 1 MATCH, SO BE SURE TO DO A, B, C, and D!

$\sqrt{32} = 5.7$

Simplifying Square Roots

- Key things you must know:
  - Square root is a number that two numbers multiply together to equal
    - Ex.) $\sqrt{4} = 2$ because 2 x 2 = 4
    - Ex.) $\sqrt{81} = 9$

- Use Calculator keys

  2nd   **x^2**
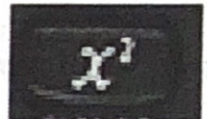

Simplify

- Ex. 2)

$\sqrt{162}$

A.) $9\sqrt{2} = 12.7$

B.) $81\sqrt{2} = 114.6$

C.) 54

D.) 6

$\sqrt{81}\ \sqrt{2}$

$9\sqrt{2}$

$\sqrt{162} = 12.7$

Simplify

- Ex. 3)

$$\sqrt{72} = 8.5$$

(handwritten tree: $\sqrt{36}$ $\sqrt{2}$, $6\sqrt{2}$)

A.) $2\sqrt{6} = 4.9$

B.) $6\sqrt{2} = 8.5$ *(circled)*

C.) $36\sqrt{2}$

D.) $12\sqrt{6}$

- Ex. 4)

$$\sqrt{605}$$

(handwritten tree: $\sqrt{121}$ $\sqrt{5}$, $11\sqrt{5}$)

A.) $55\sqrt{11}$

B.) $121\sqrt{5}$

C.) $11\sqrt{5} = 24.6$ *(circled)*

D.) $5\sqrt{11}$

$\sqrt{605} = 24.6$

Ex. 5)

$$\sqrt{15x}$$

The expression above should be further simplified for which value of x?

A. $19 \div 3$

B. $14 \div 3$

C. $21 \div 3$ *(circled)*

D. $38 \div 3$

$\dfrac{15}{x \cdot 15}$

$3 \cdot 5$

Ex. 6)

$$\sqrt{51x}$$

The expression above should be further simplified for which value of x?

A. $9 \div 3$ *(circled)*

B. $11 \div 3$

C. $14 \div 3$

D. $16 \div 3$

$\dfrac{51}{1 \cdot 51}$

$3 \cdot 17$

Steps for Examples 5 and 6

- Find all the factors of the number next to x under square root
  - I will show you an easy way to do this.

- Take the smallest number (other than 1) and divide it into all the choices.
  - If it goes in evenly into one of the choices, that choice is your answer
  - If not, continue this process with the rest of the factors.

For Examples 7 and 8

- Take the number in front of the radical in the question and divide it by the number in front of the radical by the x.

- Take that number and square it.

- That number is your answer

Ex. 7)

$3\sqrt{41x}$

Which value of x makes the expression above equivalent to $15\sqrt{41}$?

$15 \div 3 = 5^2$

A. 5

B. 25

C. 50

D. 100

Ex. 8)

$1\sqrt{31x}$

Which value of x makes the expression above equivalent to $15\sqrt{31}$?

$15 \div 1 = 15^2$

A. 15

B. 30

C. 225

D. 465

Ex. 9)

$$\sqrt{10} - 4\sqrt{10} = -9.5$$

A. $5\sqrt{10}$

B. $-3\sqrt{10} = -9.5$

C. $-3\sqrt{20}$

D. $5\sqrt{20}$

Ex. 10)

$$5\sqrt{2} + \sqrt{18} = 11.3$$

A. $8\sqrt{2} = 11.3$

B. $6\sqrt{18}$

C. $14\sqrt{2}$

D. $8\sqrt{18}$

Operations with Square Roots

- Enter the problem into calculator to find the decimal

- Enter the choices into calculator to find the decimals

- Find the match.

- If there is more than one match, go with the smaller number under the square root.

Ex. 11)

$$7\sqrt{7} - 2\sqrt{28} = 7.9$$

A. $3\sqrt{28}$

B. $-\sqrt{7}$

C. $5\sqrt{28}$

D. $3\sqrt{7} = 7.9$

Ex 12.)

$$\sqrt{50} \times 3\sqrt{2}$$

A. $6\sqrt{13}$

B. 30

C. 6

D. 10

Ex 13)

$$\sqrt{12} \times 4\sqrt{3}$$

A. 24

B. $4\sqrt{15}$

C. 6

D. 7