

Comparing & Ordering Numbers

THINGS TO REMEMBER

- Always convert numbers to a decimal & compare place values from least to greatest.
- The bigger the negative, the smaller its value.
- Usually round to the nearest hundredth. (2 decimal places)
- To change a percent to a decimal, move the decimal 2 places to the left.
- $<$ less than $>$ ~~the~~ greater than

CALCULATOR KEYS

NEGATIVE NUMBERS → ALWAYS USE THE (-) BUTTON...NOT THE SUBTRACTION SIGN!!!!

Fraction to Decimal: $\frac{\blacksquare}{\blacksquare} \rightarrow S \leftrightarrow D$	$\frac{4}{12} \rightarrow \frac{1}{3}$	Mixed numbers $\blacksquare \frac{\blacksquare}{\blacksquare} : \text{SHIFT} \rightarrow \blacksquare$	$3\frac{3}{7} \rightarrow \frac{24}{7}$
Exponents: x^{\blacksquare}	$3^{-3} \rightarrow \frac{1}{27}$	Percent % symbol: SHIFT → (5% → <u>0.05</u>
Absolute Value : Abs	$ -10 \rightarrow 10$	Pi π symbol: SHIFT → $\times 10^x$	$\frac{3\pi}{2} \rightarrow$ _____
Repeating Bar $\bar{\blacksquare}$: ALPHA → $\sqrt{\blacksquare}$	$3.\overline{12} \rightarrow$ _____	Cube root $\sqrt[3]{\blacksquare}$ symbol: SHIFT → $\sqrt{\blacksquare}$	$\sqrt[3]{83} \rightarrow \underline{4.36}$

Ex. 1) In each circle, place the correct symbol ($<$, $>$, $=$).

- A) $\frac{\sqrt{15}}{2} \bigcirc 1\frac{8}{9}$ B) $-\frac{13}{3} \bigcirc -\frac{7\pi}{5}$ C) $\frac{25}{3} \bigcirc 90\%$ D) $3.14 \bigcirc \pi$
- 1.94 1.89
-4.33 -4.40
8.33 0.90
3.14 3.14

Ex. 2) List the numbers from least to greatest.

{ 3.85, -4.5, $-\frac{14}{3}$, $\frac{5\pi}{4}$, -2, $3\frac{5}{6}$ }

\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow
3.85 -4.5 -4.67 3.93 -2 3.83

$-\frac{14}{3}$ -4.5 -2 3.83 3.85 3.93

Ex. 3) List the numbers from greatest to least.

{ 1.34, $\sqrt{3}$, $-\frac{5}{3}$, -0.4, $-\frac{9}{7}$, 61% }

\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow
1.34 1.73 -1.67 -0.4 -1.29 0.61

$\sqrt{3}$ 1.34 61% -0.4 $-\frac{9}{7}$ $-\frac{5}{3}$

PRACTICE: Comparing and Ordering Real Numbers

1.) List the numbers from least to greatest.

$$\{-6, -2\pi, \sqrt{37}, 45\%, -\frac{13}{2}\}$$

\downarrow \downarrow \downarrow \downarrow \downarrow
~~-6~~ ~~-6.28~~ ~~6.08~~ ~~0.45~~ ~~-6.5~~

$\frac{-13}{2}$ -2π -6 45% $\sqrt{37}$

2.) List the numbers from greatest to least.

$$\{-4, 7\%, 4.12, -\sqrt{19}, -3\sqrt{2}\}$$

\downarrow \downarrow \downarrow \downarrow \downarrow
~~-4~~ ~~0.07~~ ~~4.12~~ ~~-4.36~~ ~~-4.24~~

4.12 7% -4 $-3\sqrt{2}$ $-\sqrt{19}$

3.) List the numbers from greatest to least.

$$\{\pi^2, 6.8, 7\sqrt{3}, 2\pi\}$$

\downarrow \downarrow \downarrow \downarrow
~~9.87~~ ~~6.8~~ ~~12.12~~ ~~6.28~~

$7\sqrt{3}$ π^2 6.8 2π

4.) List the numbers from least to greatest.

$$\{\frac{\sqrt{5}}{5}, 35\%, |-0.4|, 0.\overline{15}\}$$

\downarrow \downarrow \downarrow \downarrow
~~0.45~~ ~~0.35~~ ~~0.4~~ ~~0.1515~~

$0.\overline{15}$ 35% $|-0.4|$ $\frac{\sqrt{5}}{5}$

5.) List the numbers from least to greatest.

$$\{4\frac{2}{3}, 460\%, \sqrt{19}, \frac{13}{\pi}\}$$

\downarrow \downarrow \downarrow \downarrow
~~4.67~~ ~~4.60~~ ~~4.36~~ ~~4.19~~

$\frac{13}{\pi}$ $\sqrt{19}$ 460% $4\frac{2}{3}$

6.) List the numbers from least to greatest.

$$\{\frac{\sqrt{24}}{2}, \frac{30}{13}, 242\%, 2.\overline{7}\}$$

\downarrow \downarrow \downarrow \downarrow
~~2.45~~ ~~2.31~~ ~~2.42~~ ~~2.77~~

$\frac{30}{13}$ 242% $\frac{\sqrt{24}}{2}$ $2.\overline{7}$

Directions: Write each number as a decimal and then fill each circle in with the correct symbol: $<$, $>$, or $=$.

7.) $\frac{11}{2}$ $\left(< \right)$ $5\frac{5}{9}$
 5.50 5.56

8.) $-\frac{11}{3}$ $\left(> \right)$ -3.72
 -3.67 -3.72

9.) $\frac{21}{8}$ $\left(> \right)$ -3.5
 2.63 -3.5

10.) π $\left(= \right)$ 3.14
 3.14 3.14

11.) $-\frac{5}{8}$ $\left(> \right)$ $-\sqrt{2}$
 -0.63 -1.41

12.) 4.15 $\left(< \right)$ $\frac{13}{3}$
 4.15 4.33

Keystone Questions: Comparing & Ordering Real Numbers

1.) Two expressions are shown below.

$$\sqrt{x} \quad \frac{x}{4}$$

For which value of x is the value of $\frac{x}{4}$ greater than the value of \sqrt{x} ? Circle the correct answer.

~~A) 5~~ ~~B) 10~~ ~~C) 15~~ D) 20

$\frac{5}{4} = 1.25$ $\sqrt{5} = 2.23$ $\frac{10}{4} = 2.5$ $\sqrt{10} = 3.16$ $\frac{15}{4} = 3.75$ $\sqrt{15} = 3.87$ $\frac{20}{4} = 5$ $\sqrt{20} = 4.47$

2.) Four expressions are shown below.

\sqrt{x}

$2x$

x^2

$\frac{x}{2}$

Which inequality comparing two of the expressions is true when $0.3 < x < 0.5$? Circle the correct answer.

$\sqrt{0.4} = 0.63$

$2(0.4) = 0.8$

$(0.4)^2 = 0.16$

\downarrow
 0.4

$\frac{0.4}{2} = 0.2$

A) $x^2 > \sqrt{x}$

B) $\frac{x}{2} < x^2$

C) $2x < \sqrt{x}$

D) $\sqrt{x} > \frac{x}{2}$

3.) Place the following expressions in order from least to greatest when $0 < x < 0.2$.

$$\begin{aligned} &\sqrt{5x} \\ &= \sqrt{5(0.1)} \\ &= \sqrt{0.5} \\ &= 0.71 \end{aligned}$$

$$\begin{aligned} &\frac{x}{5} \\ &\frac{0.1}{5} = 0.02 \end{aligned}$$

$5 - x$

$$\begin{aligned} &5 - 0.1 \\ &= 4.9 \end{aligned}$$

$5x$

$$\begin{aligned} &5(0.1) \\ &= 0.5 \end{aligned}$$

$\frac{x}{5}$

$5x$

$\sqrt{5x}$

$5 - x$

PRACTICE: KEYSTONE PROBLEMS

1.)

Two expressions are shown below.

$$\pi x > \frac{\pi}{x}$$

For which value of x is the value of πx greater than the value of $\frac{\pi}{x}$? Circle the correct answer.

$$\pi(0.3) = 0.15$$



$$\frac{\pi}{0.3} = 10.47$$

A) 0.3

$$\pi(0.6) = 1.88$$



$$\frac{\pi}{0.6} = 5.24$$

B) 0.6

$$\pi(0.9) = 2.83$$



$$\frac{\pi}{0.9} = 3.49$$

C) 0.9

$$\pi(1.2) = 3.77$$



$$\frac{\pi}{1.2} = 2.6$$

D) 1.2

2.)

Four expressions are shown below.

$$\frac{x}{3} \cdot \frac{0.5}{3} = 0.17$$

$$3x \cdot 3(0.5) = 1.5$$

$$\frac{3}{x} \cdot \frac{3}{0.5} = 6$$

$$\sqrt{3x} \cdot \sqrt{3(1.5)} = 1.22$$

Which inequality comparing two of the expressions is true when $0.4 < x < 0.9$? Circle the correct answer.

↓
0.5

A) $\sqrt{3x} > \frac{x}{3}$

B) $\sqrt{3x} > 3x$

C) $3x < \frac{x}{3}$

D) $\frac{3}{x} < 3x$

3.) List the numbers from least to greatest.

5π	$3\sqrt{32}$	$ -14.8 $	$15\frac{4}{5}$
15.71	16.97	14.8	15.8

|-14.8| 5π $15\frac{4}{5}$ $3\sqrt{32}$

4.) List the numbers from greatest to least.

π^2	$\frac{\sqrt{93}}{2}$	2π	$\sqrt{8}$
9.87	4.82	6.28	2.83

π^2 2π $\frac{\sqrt{93}}{2}$ $\sqrt{8}$

Simplifying Square Roots

- When simplifying square roots, we want to divide any perfect square factors out of the number under the $\sqrt{\quad}$ sign.
- The number is fully (completely) simplified when the number under the $\sqrt{\quad}$ no longer has any perfect square factors.

ex.) Simplify $\sqrt{45}$

1.) Make a list of perfect squares at the top of your paper:

1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169

2.) Find the largest perfect square that divides into the number under the $\sqrt{\quad}$ and factor it using that perfect square number and its other factor.

Be sure to put the perfect square factor first!

3.) Simplify the perfect square root but leave the second one the $\sqrt{\quad}$.

$$\begin{array}{l} \sqrt{45} \\ \swarrow \quad \searrow \\ \sqrt{9} \cdot \sqrt{5} \\ = 3\sqrt{5} \end{array}$$

WARNING: If you do not use the largest perfect square factor, you will have to simplify it again.

USED LARGEST PERFECT SQUARE

ex. $\sqrt{32} = \boxed{4\sqrt{2}}$

$$\begin{array}{l} \sqrt{32} \\ \swarrow \quad \searrow \\ \sqrt{16} \sqrt{2} \\ = 4\sqrt{2} \end{array}$$

DID NOT USE LARGEST PERFECT SQUARE

ex.) $\sqrt{32} = \boxed{4\sqrt{2}}$

$$\begin{array}{l} \sqrt{32} \\ \swarrow \quad \searrow \\ \sqrt{4} \sqrt{8} \\ \boxed{2} \quad \sqrt{4} \sqrt{2} \\ \quad \quad \boxed{2} \end{array}$$

Directions: Simplify each square root.

1) $\sqrt{44}$

$$\begin{array}{l} \sqrt{44} \\ \swarrow \quad \searrow \\ \sqrt{4} \sqrt{11} \\ = \boxed{2\sqrt{11}} \end{array}$$

2) $\sqrt{300}$

$$\begin{array}{l} \sqrt{300} \\ \swarrow \quad \searrow \\ \sqrt{100} \sqrt{3} \\ = \boxed{10\sqrt{3}} \end{array}$$

3) $\sqrt{98}$

$$\begin{array}{l} \sqrt{98} \\ \swarrow \quad \searrow \\ \sqrt{49} \sqrt{2} \\ = \boxed{7\sqrt{2}} \end{array}$$

PRACTICE: SIMPLIFYING SQUARE ROOTS

Directions: Fully simplify each square root. Show all of your work. Be sure to first make a list of perfect squares to help you out!

1.) $\sqrt{8}$
 $\sqrt{4} \sqrt{2}$
 $= \boxed{2\sqrt{2}}$

2.) $\sqrt{12}$
 $\sqrt{4} \sqrt{3}$
 $= \boxed{2\sqrt{3}}$

3.) $\sqrt{80}$
 $\sqrt{16} \sqrt{5}$
 $= \boxed{4\sqrt{5}}$

4.) $\sqrt{40}$
 $\sqrt{4} \sqrt{10}$
 $= \boxed{2\sqrt{10}}$

5.) $\sqrt{72}$
 $\sqrt{9} \sqrt{8}$
 $= 3\sqrt{8}$
 $\sqrt{4} \sqrt{2}$
 $= \boxed{6\sqrt{2}}$

6.) $\sqrt{20}$
 $\sqrt{4} \sqrt{5}$
 $= \boxed{2\sqrt{5}}$

7.) $\sqrt{27}$
 $\sqrt{9} \sqrt{3}$
 $= \boxed{3\sqrt{3}}$

8.) $\sqrt{10}$
 $\boxed{\sqrt{10}}$

9.) $\sqrt{99}$
 $\sqrt{9} \sqrt{11}$
 $= \boxed{3\sqrt{11}}$

10.) $\sqrt{32}$
 $\sqrt{16} \sqrt{2}$
 $= \boxed{4\sqrt{2}}$

11.) $\sqrt{108}$
 $\sqrt{9} \sqrt{12}$
 $= 3\sqrt{12}$
 $\sqrt{4} \sqrt{3}$
 $2\sqrt{3}$
 $= \boxed{6\sqrt{3}}$

12.) $\sqrt{200}$
 $\sqrt{100} \sqrt{2}$
 $= \boxed{10\sqrt{2}}$

13.) $\sqrt{20}$
 $\sqrt{4} \sqrt{5}$
 $= \boxed{2\sqrt{5}}$

14.) $\sqrt{98}$
 $\sqrt{49} \sqrt{2}$
 $= \boxed{7\sqrt{2}}$

15.) $\sqrt{45}$
 $\sqrt{9} \sqrt{5}$
 $= \boxed{3\sqrt{5}}$

16.) $\sqrt{96}$
 $\sqrt{16} \sqrt{6}$
 $= \boxed{4\sqrt{6}}$

Square Roots Review

Directions: Estimate each square root to the nearest whole number. **NO CALCULATOR!!!!**

1 4 9 16 25 36 49 64 81 100 121 144 169

1. $\sqrt{21}$

$$\sqrt{21}$$

2. $\sqrt{43}$

$$\sqrt{43}$$

3. $\sqrt{59}$

$$\sqrt{59}$$

4. $\sqrt{50}$

$$\sqrt{25} \sqrt{2} \\ = 5\sqrt{2}$$

5. $\sqrt{70}$

$$\sqrt{70}$$

6. $\sqrt{33}$

$$\sqrt{33}$$

7. $\sqrt{29}$

$$\sqrt{29}$$

8. $\sqrt{48}$

$$\sqrt{16} \sqrt{3} \\ = 4\sqrt{3}$$

9. $\sqrt{65}$

$$\sqrt{65}$$

10. $\sqrt{61}$

$$\sqrt{61}$$

11. $\sqrt{18}$

$$\sqrt{9} \sqrt{2} \\ = 3\sqrt{2}$$

12. $\sqrt{6}$

$$\sqrt{6}$$

13. $\sqrt{89}$

$$\sqrt{89}$$

14. $\sqrt{52}$

$$\sqrt{4} \sqrt{13} \\ = 2\sqrt{13}$$

15. $\sqrt{104}$

$$\sqrt{4} \sqrt{26} \\ = 2\sqrt{26}$$

16. $\sqrt{123}$

$$\sqrt{123}$$

17. $\sqrt{95}$

$$\sqrt{95}$$

18. $\sqrt{102}$

$$\sqrt{102}$$

19. $\sqrt{142}$

$$\sqrt{142}$$

20. $\sqrt{3}$

$$\sqrt{3}$$

21. $\sqrt{32}$

$$\sqrt{16} \sqrt{2} \\ = 4\sqrt{2}$$

22. $\sqrt{24}$

$$\sqrt{4} \sqrt{6} \\ = 2\sqrt{6}$$

23. $\sqrt{44}$

$$\sqrt{4} \sqrt{11} \\ = 2\sqrt{11}$$

24. $\sqrt{72}$

$$\sqrt{9} \sqrt{8} \\ = 3\sqrt{8} \\ = 6\sqrt{2}$$

25. $\sqrt{75}$

$$\sqrt{25} \sqrt{3} \\ = 5\sqrt{3}$$

26. $\sqrt{500}$

$$\sqrt{100} \sqrt{5} \\ = 10\sqrt{5}$$

27. $\sqrt{50}$

$$\sqrt{25} \sqrt{2} \\ = 5\sqrt{2}$$

28. $\sqrt{18}$

$$\sqrt{9} \sqrt{2} \\ = 3\sqrt{2}$$

29. $\sqrt{150}$

$$\sqrt{25} \sqrt{6} \\ = 5\sqrt{6}$$

30. $\sqrt{125}$

$$\sqrt{25} \sqrt{5} \\ = 5\sqrt{5}$$

Simplifying More Complex Square Roots

1 4 9 16 25 36 49 64 81 100 121 144 169

Directions: Simplify each of the following square roots.

$$\begin{aligned} \text{Ex 1) } & \sqrt{5 \cdot 63} \\ & \sqrt{9 \cdot 7} \\ & 3\sqrt{7} \\ & = \boxed{15\sqrt{7}} \end{aligned}$$

$$\begin{aligned} \text{Ex 2) } & \sqrt{25 \cdot 100} \\ & 5 \cdot 10 \\ & = \boxed{100} \end{aligned}$$

$$\begin{aligned} \text{Ex 3) } & \sqrt{6 \cdot 20} \\ & \sqrt{4 \cdot 5} \\ & 2\sqrt{5} \\ & = \boxed{12\sqrt{5}} \end{aligned}$$

$$\begin{aligned} \text{Ex 4) } & -\sqrt{25 \cdot 75} \\ & -5\sqrt{3} \\ & = \boxed{-10\sqrt{3}} \end{aligned}$$

$$\begin{aligned} \text{Ex 5) } & \sqrt{100 \cdot 7} \\ & 10\sqrt{7} \\ & = \boxed{50\sqrt{7}} \end{aligned}$$

$$\begin{aligned} \text{Ex 6) } & -\sqrt{9 \cdot 45} \\ & -3\sqrt{5} \\ & = \boxed{-9\sqrt{5}} \end{aligned}$$

Ex 10) A square has a side length of $\sqrt{98}$. Which expression represents the exact length of the square? Circle the correct answer.

$$\begin{aligned} &\sqrt{98} \\ &\sqrt{49 \cdot 2} \\ &= 7\sqrt{2} \end{aligned}$$

- A) 9.9 B) $2\sqrt{7}$ **C) $7\sqrt{2}$** D) $7\sqrt{5}$

Ex 11) The length of a diagonal of a rectangle is $5\sqrt{2}$. Which number is equal to the length of the diagonal? Circle the correct answer.

$$\begin{aligned} &\downarrow \\ &5^2 = 25 \quad \sqrt{25} \cdot \sqrt{2} = \sqrt{50} \end{aligned}$$

- A) $\sqrt{10}$ B) $\sqrt{29}$ C) $\sqrt{20}$ **D) $\sqrt{50}$**

Ex 12) Which expression can be simplified to $2\sqrt{n+4}$ where n is a positive integer? Circle the correct answer.

- $2\sqrt{10}$ $2\sqrt{2}$ $3\sqrt{2}$ $3\sqrt{5}$
A) $\sqrt{40}$ B) $\sqrt{8}$ C) $\sqrt{18}$ D) $\sqrt{45}$

Ex 13) When $x = 5$, which expression can be simplified to $15\sqrt{2}$? Circle the correct answer.

$$\begin{aligned} &3\sqrt{25} \\ &3(5) \\ &= 15 \end{aligned}$$

$$\begin{aligned} &3\sqrt{10(5)} \\ &3\sqrt{50} \\ &\sqrt{25} \cdot 2 \\ &15\sqrt{2} \end{aligned}$$

$$\begin{aligned} &5\sqrt{3(5)} \\ &5\sqrt{15} \end{aligned}$$

$$\begin{aligned} &5\sqrt{10(5)} \\ &5\sqrt{50} \\ &\sqrt{25} \cdot \sqrt{2} \\ &25\sqrt{2} \end{aligned}$$

- A) $3\sqrt{5x}$ **B) $3\sqrt{10x}$** C) $5\sqrt{3x}$ D) $5\sqrt{10x}$

PRACTICE: Simplifying More Complex Square Roots

Directions: Simplify each of the following square roots.

1) $\sqrt{8}$ $\sqrt{4} \sqrt{2}$ $= \boxed{2\sqrt{2}}$	2) $\sqrt{18}$ $\sqrt{9} \sqrt{2}$ $= \boxed{3\sqrt{2}}$	3) $\sqrt{27}$ $\sqrt{9} \sqrt{3}$ $= \boxed{3\sqrt{3}}$
4) $\sqrt{250}$ $\sqrt{25} \sqrt{10}$ $= \boxed{5\sqrt{10}}$	5) $\sqrt{24}$ $\sqrt{4} \sqrt{6}$ $= \boxed{2\sqrt{3}}$	6) $\sqrt{400}$ $\sqrt{100} \sqrt{4}$ $10 \cdot 2 = \boxed{20}$
7) $5\sqrt{144}$ (12) $5 \cdot 12$ $= \boxed{60}$	8) $-2\sqrt{90}$ $\sqrt{9} \sqrt{10}$ $3\sqrt{10}$ $= \boxed{-6\sqrt{10}}$	9) $3\sqrt{50}$ $\sqrt{25} \sqrt{2}$ $5\sqrt{2}$ $= \boxed{15\sqrt{2}}$
10) $5\sqrt{44}$ $\sqrt{4} \sqrt{11}$ $2\sqrt{11}$ $= \boxed{10\sqrt{11}}$	11) $-6\sqrt{300}$ $\sqrt{100} \sqrt{3}$ $10\sqrt{3}$ $= \boxed{-60\sqrt{3}}$	12) $2\sqrt{160}$ $\sqrt{16} \sqrt{10}$ $4\sqrt{10}$ $= \boxed{8\sqrt{10}}$

13) The decimal approximation of $\sqrt{70}$ is a value between what two integers? Circle the correct answer.

$$\begin{array}{cc} \downarrow & \downarrow \\ \sqrt{64} & \sqrt{81} \\ 8 & + & 9 \end{array}$$

A) 6 and 7

B) 7 and 8

C) 8 and 9

D) 9 and 10

14) Which expression is equivalent to $2\sqrt{7}$? Circle the correct answer.

$$\begin{array}{l} 2^2 \cdot 7 \\ 4 \cdot 7 = 28 \end{array}$$

A) $\sqrt{98}$

B) $\sqrt{28}$

C) $\sqrt{14}$

D) $\sqrt{32}$

15) A rectangle has a diagonal length of $\sqrt{45}$. Which expression represents the exact length of the diagonal? Circle the correct answer.

$$\begin{array}{l} \sqrt{45} \\ \wedge \\ \sqrt{9} \sqrt{5} \\ 3\sqrt{5} \end{array}$$

A) $5\sqrt{3}$

B) $3\sqrt{5}$

C) $2\sqrt{7}$

D) 6.71

16) Which expression can be simplified to $5\sqrt{r+4}$ where r is a negative integer? Circle the correct answer.

$$\begin{array}{l} \sqrt{40} \\ \wedge \\ \sqrt{4} \sqrt{10} \\ 2\sqrt{10} \end{array}$$

$$\begin{array}{l} \sqrt{54} \\ \wedge \\ \sqrt{9} \sqrt{6} \\ 3\sqrt{6} \end{array}$$

$$\begin{array}{l} \sqrt{125} \\ \wedge \\ \sqrt{25} \sqrt{5} \\ 5\sqrt{5} \end{array}$$

$$\begin{array}{l} \sqrt{75} \\ \wedge \\ \sqrt{25} \sqrt{3} \\ 5\sqrt{3} \end{array}$$

A) $\sqrt{40}$

B) $\sqrt{54}$

C) $\sqrt{125}$

D) $\sqrt{75}$

Simplifying Square Roots

Working Backwards

Directions: Work backwards to find the original square root. Be sure to SHOW ALL STEPS!

STEPS:

- 1.) Write the whole number in square root form by squaring it (multiplying it by itself).
- 2.) Multiply the numbers under the square root symbols together.

1.) What square root simplifies to: $2\sqrt{5}$

Prove it $2^2 = 4$ $\sqrt{4} \cdot \sqrt{5} = \sqrt{20}$

2.) What square root simplifies to: $3\sqrt{7}$

Prove it $3^2 = 9$ $\sqrt{9} \cdot \sqrt{7} = \sqrt{63}$

3.) What square root simplifies to: $4\sqrt{2}$

Prove it $4^2 = 16$ $\sqrt{16} \cdot \sqrt{2} = \sqrt{32}$

4.) What square root simplifies to: $2\sqrt{13}$

Prove it $2^2 = 4$ $\sqrt{4} \cdot \sqrt{13} = \sqrt{52}$

5.) What square root simplifies to: $6\sqrt{3}$

Prove it $6^2 = 36$ $\sqrt{36} \cdot \sqrt{3} = \sqrt{108}$

Simplifying Square Roots Review

FULLY Simplify each square root.

1) $\sqrt{75}$
 $\sqrt{25} \sqrt{3}$
 $\boxed{5\sqrt{3}}$

2) $\sqrt{16}$
 $\boxed{4}$

3) $\sqrt{36}$
 $\boxed{6}$

4) $\sqrt{64}$
 $\boxed{8}$

5) $\sqrt{80}$
 $\sqrt{16} \sqrt{5}$
 $\boxed{4\sqrt{5}}$

6) $\sqrt{30}$
 $\boxed{\sqrt{30}}$

7) $\sqrt{8}$
 $\sqrt{4} \sqrt{2}$
 $\boxed{2\sqrt{2}}$

8) $\sqrt{18}$
 $\sqrt{9} \sqrt{2}$
 $\boxed{3\sqrt{2}}$

9) $\sqrt{32}$
 $\sqrt{16} \sqrt{2}$
 $\boxed{4\sqrt{2}}$

10) $\sqrt{12}$
 $\sqrt{4} \sqrt{3}$
 $\boxed{2\sqrt{3}}$

11) $7\sqrt{8}$
 $2\sqrt{2}$
 $= \boxed{14\sqrt{2}}$

12) $2\sqrt{108}$
 $\sqrt{36} \sqrt{3}$
 $6\sqrt{3}$
 $= \boxed{12\sqrt{3}}$

13) $3\sqrt{125}$
 $\sqrt{25} \sqrt{5}$
 $= 5\sqrt{5}$
 $\boxed{15\sqrt{5}}$

14) $3\sqrt{50}$
 $\sqrt{25} \sqrt{2}$
 $5\sqrt{2}$
 $= \boxed{15\sqrt{2}}$

15) $4\sqrt{175}$
 $\sqrt{25} \sqrt{7}$
 $5\sqrt{7}$
 $= \boxed{20\sqrt{7}}$

16) $5\sqrt{28}$
 $\sqrt{4} \sqrt{7}$
 $2\sqrt{7}$
 $\boxed{10\sqrt{7}}$

For #17-20, state what square root simplifies to given number for each problem. SHOW ALL WORK!

17) $3\sqrt{5}$
 $3^2 = 9$
 $\sqrt{9} \cdot \sqrt{5}$
 $= \boxed{\sqrt{45}}$

18) $6\sqrt{2}$
 $6^2 = 36$
 $\sqrt{36} \cdot \sqrt{2}$
 $= \boxed{\sqrt{72}}$

19) $2\sqrt{5}$
 $2^2 = 4$
 $\sqrt{4} \cdot \sqrt{5}$
 $= \boxed{\sqrt{20}}$

20) $5\sqrt{6}$
 $5^2 = 25$
 $\sqrt{25} \cdot \sqrt{6}$
 $= \boxed{\sqrt{150}}$