

Unit 1

Operations with Real Numbers

Compare and Order Least to Greatest

• Ex. 4)

$$\frac{1}{7}, -0.6, 0.5, \frac{5}{14}$$

$$\begin{aligned}\frac{1}{7} &= 0.14 \text{ 2nd} \\ -0.6 &= -0.6 \text{ 1st} \\ 0.5 &= 0.5 \text{ 4th} \\ \frac{5}{14} &= 0.35 \text{ 3rd}\end{aligned}$$

1. Change All Numbers into Decimals.

2. Compare.

3. Put in Order Using the Original Form.

$$-0.6, \frac{1}{7}, \frac{5}{14}, 0.5$$

$$\text{or} \\ -0.6 < \frac{1}{7} < \frac{5}{14} < 0.5$$

Insert either <, >, or =

• Ex. 1) $\sqrt{98} ? \frac{55}{6}$ $\textcircled{>}$

$$9.89 > 9.16$$

• Ex. 2) $\frac{16}{5} ? \pi$ $\textcircled{>}$

$$3.2 > 3.14$$

• Ex. 3) $\frac{\pi}{3} ? 1.044$ $\textcircled{>}$

$$1.047 > 1.04444$$

(You can order from Greatest to Least in the same way)

• Ex. 5)

$$3, -0.2, \frac{5}{8}, 0.3, \sqrt{2}$$

$$\begin{aligned}3 &= 3 \text{ 1st} \\ -0.2 &= -0.2 \text{ 5th} \\ \frac{5}{8} &= 0.625 \text{ 3rd} \\ 0.3 &= 0.3 \text{ 4th} \\ \sqrt{2} &= 1.41 \text{ 2nd}\end{aligned}$$

$$3, \sqrt{2}, \frac{5}{8}, 0.3, -0.2$$

$$\text{or} \\ 3 > \sqrt{2} > \frac{5}{8} > 0.3 > -0.2$$

Ex. 6) Four expressions are shown below

$$2\sqrt{x} \quad 2x^2 \quad \frac{2}{x} \quad \frac{x}{2}$$

Which inequality comparing two of the expressions is true when $0.1 \leq x \leq 0.5$?

A. $\frac{x}{2} > 2x^2$

B. $2\sqrt{x} > \frac{2}{x}$

C. $\frac{2}{x} > \frac{x}{2}$

D. $2x^2 > 2\sqrt{x}$

$x = 0.1$

$2\sqrt{x}$	$2x^2$	$\frac{2}{x}$	$\frac{x}{2}$
0.63	0.02	20	0.05

A.) $0.05 > 0.02$

B.) $0.63 > 20$

C.) $20 > 0.05$

D.) $0.02 > 0.63$

$x = 0.5$

$2\sqrt{x}$	$2x^2$	$\frac{2}{x}$	$\frac{x}{2}$
1.41	0.5	4	0.25

A.) $0.05 > 0.5$

B.) $1.41 > 4$

C.) $4 > 0.25$

D.) $0.5 > 1.41$

Ex. 7)

Which of the following inequalities is true for all real values of x ?

A. $5\sqrt{x^2} \leq \frac{x}{4}$

B. $(4x)^3 \leq 5x^2$

C. $\sqrt{5x^2} \leq 5x^2$

D. $5(x^2 - 4) \leq 4(x^2 - 5)$

Pick a number
If that

$x = 10$

number to plug into x . Sometimes it works for all.
If that happens, pick another number.

A.) $5\sqrt{10^2} \leq \frac{10}{4} \rightarrow 50 \leq 2.5$ C.) $\sqrt{5 \cdot 10^2} \leq 5(10)^2 \rightarrow 22.36 \leq 500$

B.) $(4 \cdot 10)^3 \leq 5(10)^2 \rightarrow 6400 \leq 500$ D.) $5(10^2 - 4) \leq 4(10^2 - 5) \rightarrow 480 \leq 380$