



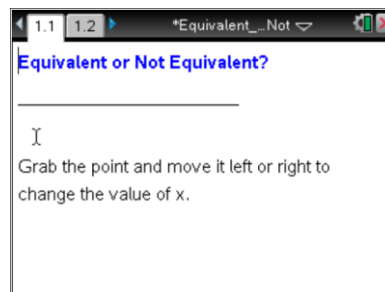
**Equivalent or Not Equivalent?**  
**Student Activity**

Name \_\_\_\_\_

Class \_\_\_\_\_

Open the TI-Nspire document *Equivalent\_or\_Not.tns*.

What does it mean for expressions to be *equivalent*? This activity investigates expressions that are equivalent under certain conditions on the variable.



Move to page 1.2.

Press **ctrl** **▶** and **ctrl** **◀** to navigate through the lesson.

1. Find the value for each expression when

a.  $x = 2$ .       $\frac{x^2}{x} = \underline{\hspace{2cm}}$        $\sqrt{x^2} = \underline{\hspace{2cm}}$        $|x| = \underline{\hspace{2cm}}$

b.  $x = 4$ .       $\frac{x^2}{x} = \underline{\hspace{2cm}}$        $\sqrt{x^2} = \underline{\hspace{2cm}}$        $|x| = \underline{\hspace{2cm}}$

2. Based on your answers from question 1, predict the value for each expression when  $x = 15$ .

$\frac{x^2}{x} = \underline{\hspace{2cm}}$        $\sqrt{x^2} = \underline{\hspace{2cm}}$        $|x| = \underline{\hspace{2cm}}$

3. Find the value for each expression when

a.  $x = -3$ .       $\frac{x^2}{x} = \underline{\hspace{2cm}}$        $\sqrt{x^2} = \underline{\hspace{2cm}}$        $|x| = \underline{\hspace{2cm}}$

b.  $x = -8$ .       $\frac{x^2}{x} = \underline{\hspace{2cm}}$        $\sqrt{x^2} = \underline{\hspace{2cm}}$        $|x| = \underline{\hspace{2cm}}$

4. Based on your answers from question 3, predict the value for each expression when  $x = -20$ .

$\frac{x^2}{x} = \underline{\hspace{2cm}}$        $\sqrt{x^2} = \underline{\hspace{2cm}}$        $|x| = \underline{\hspace{2cm}}$



5. Find the value for each expression when  $x = 0$ .

a.  $\frac{x^2}{x}$

b.  $\sqrt{x^2}$

c.  $|x|$

Two algebraic expressions that are equal for every substituted value of the variable chosen from a set of numbers are said to be **equivalent for that set of numbers**.

6. a. Is the expression  $\frac{x^2}{x}$  equivalent to  $x$  for the set of positive real numbers? Why or why not?

b. Is the expression  $\frac{x^2}{x}$  equivalent to  $x$  for the set of negative real numbers? Why or why not?

c. Is the expression  $\frac{x^2}{x}$  equivalent to  $x$  for the set of real numbers? Why or why not?

7. Tom says that the expression  $\sqrt{x^2}$  is equivalent to  $x$  for the set of real numbers. Do you agree? Why or why not?

8. For what values of  $x$  are  $\sqrt{x^2}$  and  $|x|$  equivalent? Explain your reasoning.