

### Algebraic Properties of Equality Practice

State the property that justifies each statement.

1. If  $RS = TU$  and  $TU = YP$  then  $RS = YP$ .

transitive property of equality

2. If  $7x = 28$ , then  $x = 4$ .

division property of equality

3. If  $x + 5 = 15$ , then  $x = 10$ .

subtraction property of equality

4. If  $CD = EF$ , then  $EF = CD$ .

symmetric property of equality

5. If  $\frac{x}{3} = 8$ , then  $x = 24$ .

multiplication property of equality

6. If  $x - 7 = 10$ , then  $x = 17$ .

addition property of equality

7.  $EF = EF$ .

reflexive property of equality

8. If  $4(x + 3) = 17$ , then  $4x + 12 = 17$ .

distributive property of equality

9. If  $CD = 5$  and  $AB = CD$ , then  $AB = 5$ .

substitution property of equality

Solve the equation. Show all the steps and write a justification for each step.

\* Remember you can add in these steps and then combine like terms for these steps using substitution as the reason.\*

$$3x + 12 = 8x - 18$$

$$\begin{array}{r} -3x \quad -3x \\ 3x + 12 = 8x - 18 \end{array}$$

$$\begin{array}{r} +18 \quad +18 \\ 3x + 12 = 8x - 18 \end{array}$$

$$\frac{30}{5} = \frac{5x}{5}$$

$$6 = x$$

may sometimes be necessary to flip! \* ~~12~~  $x = 6$

subtraction property

addition property

division property

symmetric property\*