Lesson 3.3 Solving 1-Variable Equations

The **Multiplication and Division Properties of Equality** state that when each side of the equation is multiplied by the same number, the two sides remain equal:

$$3 + 4 = 7 \quad (3 + 4) \times 5 = 7 \times 5 \quad (35 = 35)$$

When each side of the equation is divided by the same number, the two sides remain equal:

$$2 \times 6 = 12 \quad \frac{(2 \times 6)}{3} = \frac{12}{3} \quad (4 = 4)$$

Use these properties to determine the value of variables:

$n \div 5 = 4$	$3n = 18$	$\frac{60}{n} = 4$
$n \div 5 \times 5 = 4 \times 5$	$\frac{3n}{3} = \frac{18}{3}$	$\frac{60n}{n} = 4n$ or $60 = 4n$
$n = 20$	$n = 6$	$\frac{60}{4} = \frac{4n}{4} \quad 15 = n$

Find the value of the variable in each equation.

	a	**b**	**c**
1.	$5b = 35$ _____	$\frac{a}{4} = 16$ _____	$f \times 12 = 72$ _____
2.	$x \div 4 = 7$ _____	$3k = 33$ _____	$\frac{42}{b} = 7$ _____
3.	$9 \times n = 72$ _____	$44 \div m = 22$ _____	$12a = 60$ _____
4.	$\frac{n}{20} = 4$ _____	$a \times 12 = 60$ _____	$6p = 90$ _____
5.	$x \div 7 = 11$ _____	$t \div 25 = 8$ _____	$\frac{x}{15} = 6$ _____
6.	$b \times 16 = 64$ _____	$11d = 132$ _____	$\frac{65}{m} = 5$ _____
7.	$\frac{n}{14} = 3$ _____	$f \times 9 = 99$ _____	$4n = 60$ _____
8.	$e \times 5 = 120$ _____	$\frac{120}{m} = 10$ _____	$b \div 9 = 7$ _____
9.	$8t = 104$ _____	$\frac{b}{9} = 6$ _____	$m \times 18 = 54$ _____
10.	$\frac{a}{6} = 12$ _____	$7m = 84$ _____	$a \div 4 = 18$ _____