

Multiplication and division Equations

* When given a multiplication Equation

- You can use division to solve

* You must divide by the same number (next to the variable) on Both sides of the Equation.

Example:

$$4m = 20$$

← This is a multiplication Equation so we will use division to solve and find the missing value.

$$\begin{array}{r} \cancel{4}m \neq 20 \\ \hline 4 \qquad \qquad 4 \\ m \neq 5 \end{array}$$

← Since 4 is being multiplied by the variable (it is attached) we will divide both sides of the equation by 4 to get "m" by itself.

Check

$$4m = 20$$

$$4(5) = 20$$

$$\checkmark 20 = 20$$

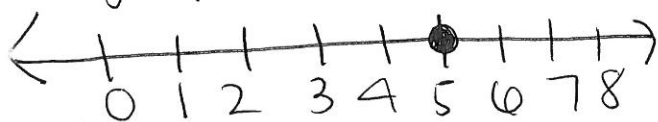
$$\checkmark \text{ so } \boxed{m = 5}$$

← Since $\frac{4}{4} = 1$ we ~~can~~ can cross it out.

← We are now left with "m" by itself (Bring down "m")

← Check solution by substituting

graph



← graph solution on a number line.

examples continued...

$$5q = 45$$

$$\frac{5q}{5} = \frac{45}{5}$$

$$q = 9$$

check

$$5q = 45$$

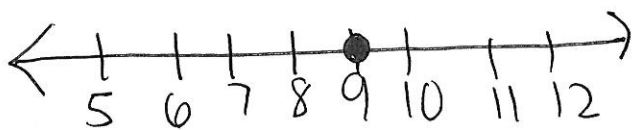
$$5(9) = 45$$

✓

$$45 = 45$$

✓ so $q = 9$

graph



$$25t = 150$$

$$\frac{25t}{25} = \frac{150}{25}$$

$$t = 6$$

check

$$25t = 150$$

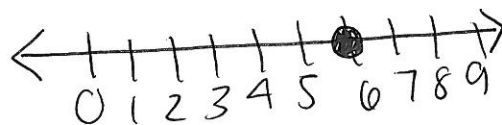
$$25(6) = 150$$

✓

$$150 = 150$$

✓ so $t = 6$

graph



* When given a division Equation

- You can use multiplication to solve.

* You must multiply both sides by the divisor/denominator (*Reciprocal*)

Example:

$$\frac{x}{5} = 10$$

← This is a division Equation so we will use multiplication to solve and find the missing value.

$$\cancel{5} \left(\frac{x}{\cancel{5}} \right) = (10) \cancel{5}$$

✓

$$x = 50$$

← Since x is being divided by 5 we will multiply Both sides by 5 to get "x" by itself.

check

$$\frac{x}{5} = 10$$

← Since $\frac{5x}{5} = x$ we

$$\frac{50}{5} = 10$$

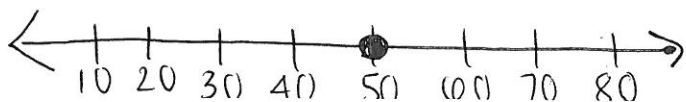
can cross out $\frac{5}{5}$

$$10 = 10$$

and Bring x down.

✓ 50 $x = 50$

← Check by substitution.



← Graph on a numberline

Examples continued...

$$15 = \frac{r}{2}$$

$$2(15) = \frac{r}{\cancel{2}} \quad (\cancel{2})$$

$$30 = r$$

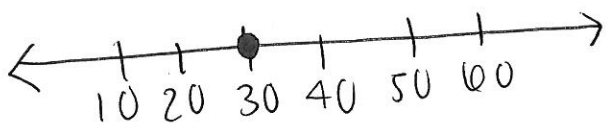
check

$$15 = \frac{r}{2}$$

$$15 = \frac{30}{2}$$

$$15 = 15 \checkmark \text{ so } \boxed{r=30}$$

graph



$$\frac{y}{9} = 1$$

$$\cancel{9}(y) = (1)\cancel{9}$$

$$y = 9$$

check

$$\frac{y}{9} = 1$$

$$\frac{9}{9} = 1$$

$$1 = 1 \checkmark \text{ so } \boxed{y=9}$$

graph

