2.8 Solve Equations Involving Fractions

Eliminate fractions by multiplying <u>every</u> term by a common denominator.

Ex. 1 Solve.

a) $\frac{x}{6} = 2$

$6 \cdot \frac{x}{6} = 2 \cdot 6$

$x = 12$

Multiply both sides by 6

b) $\frac{1}{2}a + 6 = -7$

$\frac{1}{2}a = -7 - 6$

$\frac{1}{2}a = -13$

$(2)\frac{1}{2}a = (2)(-13)$

$a = -26$

Undo adding/subtracting first

c) $\frac{x+1}{3} = 7$

$3\left(\frac{x+1}{3}\right) = 3(7)$

$x + 1 = 21$

$x = 21 - 1$

$= 20$

Multiply every term by 3

<u>Communication</u>

Keep equal signs aligned, only <u>one</u> per line.

d) $\frac{m}{2}+\frac{m}{3}=2$

Multiply every term by LCD of 2 & 3 --> 6

$6\left(\frac{m}{2}+\frac{m}{3}\right)=6(2)$

$3\cancel{6}\left(\frac{m}{\cancel{2}}\right)+\cancel{6}^{2}\left(\frac{m}{\cancel{3}}\right)=12$

$3m+2m=12$

$5m=12$

$m=\frac{12}{5}$

e) $\frac{3-2m}{4}=\frac{m}{3}$

Multiply every term by LCD of 4 & 3 --> 12

$3\,\cancel{12}\left(\frac{3-2m}{\cancel{4}}\right)=\cancel{12}^{4}\left(\frac{m}{\cancel{3}}\right)$

$3(3-2m)=4m$

$9-6m=4m$

$9=4m+6m$

$9=10m$

$\frac{9}{10}=m$

f) $\frac{x}{2}+\frac{3x-1}{4}=3-\frac{x}{6}$

Don't forget me!

Multiply every term by 12

$6\,\cancel{12}\left(\frac{x}{\cancel{2}}\right)+\cancel{12}^{3}\left(\frac{3x-1}{\cancel{4}}\right)=12(3)-\cancel{12}^{2}\left(\frac{x}{\cancel{6}}\right)$

$6x+3(3x-1)=36-2x$

$6x+9x-3=36-2x$

$15x-3=36-2x$

$15x+2x=36+3$

$\frac{17}{17}x=\frac{39}{17}$

$x=\frac{39}{17}$

g) $\frac{2}{3}(x+5)-\frac{1}{4}(x-2)=2$

Multiply both sides by 12 and reduce as you go!

$12\left[\frac{2}{3}(x+5)\right]-12\left[\frac{1}{4}(x-2)\right]=12(2)$

$8(x+5)-3(x-2)=24$

$8x+40-3x+6=24$

$5x+46=24$

$5x=24-46$

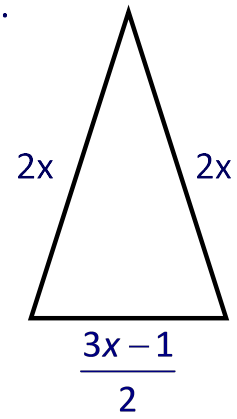
$5x=-22$

$x=-\frac{22}{5}$

Ex. 2 A triangular backyard has dimensions as shown.

a) Write an algebraic expression for the perimeter.

$P=2x+2x+\frac{3x-1}{2}$



b) Determine the dimensions of the yard if the perimeter is 60 m.