

1. $x =$

$$\frac{8}{2x} = \frac{15}{60}$$

$$8 \cdot 60 = 15 \cdot 2x$$

$$\begin{array}{r} 480 \\ \hline 30 \\ 16 \\ \times \\ \hline \end{array} = \begin{array}{r} 30x \\ \hline 30 \\ \times \\ \hline 16 \end{array}$$

1. $x =$

$$2x \left(\frac{8}{2x} = \frac{15}{60} \right)$$

$$\frac{2x \cdot 8}{2x} \div \frac{2x \cdot 15}{60}$$

$$60 \left(1 \cdot 8 = \frac{2x \cdot 15}{60} \right)$$

$$60 \cdot 1 \cdot 8 = \frac{2x \cdot 15 \cdot 60}{60}$$

$$60 \cdot 1 \cdot 8 = 2x \cdot 15 \cdot 1$$

$$60 \cdot 8 = 2x \cdot 15$$

$$7 \left(\frac{x+5}{7} + 8 \right)$$

$$\frac{7(x+5)}{7} + \frac{8 \cdot 7}{1}$$

$$x+5 + 8 \cdot 7$$

$$\left. \begin{aligned} & \frac{x}{7} + \frac{5}{7} + 8 \\ & 7 \left(\frac{x}{7} + \frac{5}{7} + 8 \right) \\ & \frac{7 \cdot x}{7} + \frac{5 \cdot 7}{7} + 8 \cdot 7 \\ & x + 5 + 8 \cdot 7 \end{aligned} \right\}$$

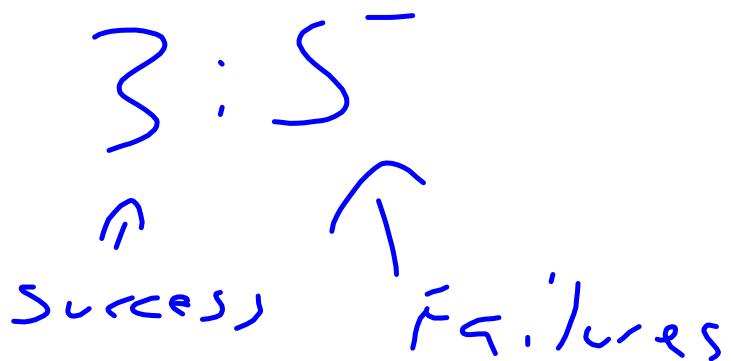
Writing ratios

$$\frac{3}{5}$$

3:5

3 to 5

odd



winning

$$\frac{3}{5}$$

losing

$$\frac{5}{8}$$

1. $\frac{7}{14}$ and $\frac{15}{30}$

are these ratios proportional

$\frac{7}{14} = \frac{?}{?}$
 $\frac{7}{7 \cdot 2} = \frac{3.5}{3.5 \cdot 2}$
 yes

Same Factor
 $\frac{\text{Factor}}{\text{itself}}$
 reduces to 1

3. $x = \underline{\hspace{2cm}}$ $\frac{x}{6} = -\frac{22}{33}$

4. $x = \underline{\hspace{2cm}}$ $\frac{x}{22} = \frac{x+4}{30}$

$\frac{x}{6} = -\frac{22}{33}$
 $\frac{x}{6} = -\frac{2 \cdot \cancel{11}}{3 \cdot \cancel{11}}$
 $\frac{x}{6} = -\frac{2}{3}$

Factor left or =
 • reduce to 1

$3 \left(\frac{x}{3 \cdot 2} = -\frac{2}{3} \right)$
 $2 \left(\frac{x}{2} = -2 \right)$
 $x = -4$

Dist. }
 reduce to 1
 reduce to 1 with dist.

$22 \left(\frac{x}{22} = \frac{x+4}{30} \right)$
 $x = \frac{22(x+4)}{30}$
 $30 \left(x = \frac{22x + 22 \cdot 4}{30} \right)$
 $30x = 22x + 22 \cdot 4$
 $8x = 88$
 $\frac{8x}{8} = \frac{88}{8}$
 $x = 11$

$22 \left(\frac{x}{22} = \frac{x}{30} + \frac{4}{30} \right)$
 $x = \frac{22x}{30} + \frac{22 \cdot 4}{30}$
 $30x = 22x + 88$
 $8x = 88$
 $\frac{8x}{8} = \frac{88}{8}$
 $x = 11$

$$\frac{3}{(x-1)} = \frac{12}{(3x+1)}$$

$$\frac{(x-1) \cdot 3}{(x-1)} = \frac{(x-1) \cdot 12}{(3x+1)}$$

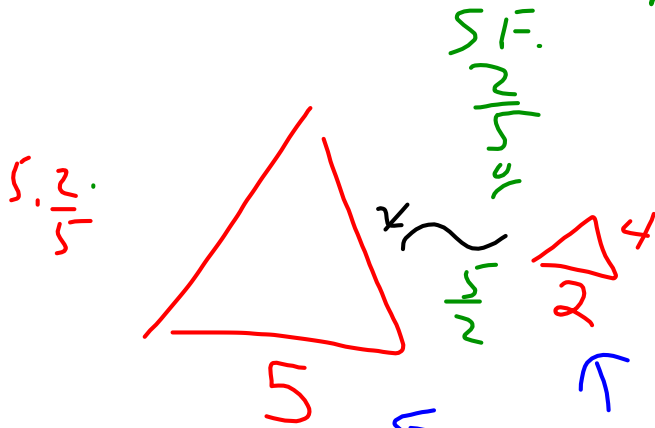
$$(3x+1) \cdot 3 = \frac{(12x-12)(3x+1)}{(3x+1)}$$

$$9x+3 = 12x-12$$

Dist.
(x-1)

Scale
measure

Factor
(x)
mult



$$2 \cdot \frac{5}{2}$$

$$\left(\frac{2}{5} = \frac{x}{5} \right)$$

$$x \left(2 = \frac{20}{x} \right)$$

$$2x = 20$$
$$x = 10$$

the
scale
factors
are

smaller
than
one

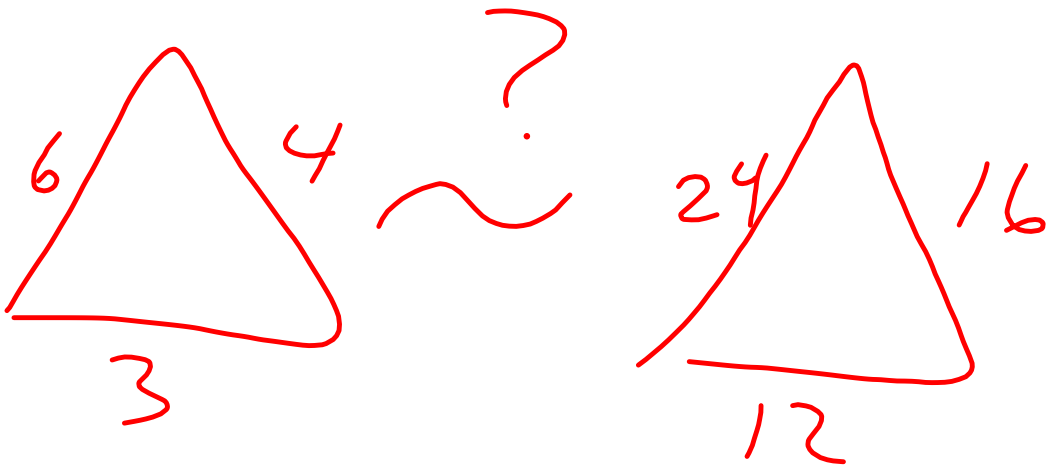
larger
than
one

Sides \cdot S.F.

new
side

$$4 = \frac{5}{2} = \frac{20}{2}$$

$$10$$

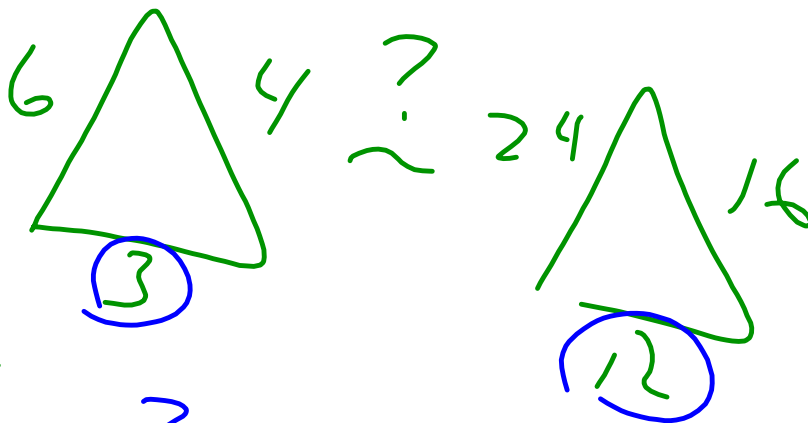


$$\frac{3}{12} = \frac{4}{16} = \frac{6}{24}$$

way

means therefore

Similar



way

$$\frac{12}{4} \text{ or } \frac{12}{3} \text{ or } \frac{12}{4} \text{ } \left. \vphantom{\frac{12}{4}} \right\} \text{S.F.}$$

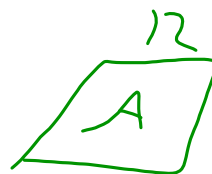
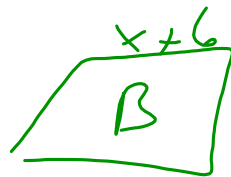
$$SI = \frac{14}{35} \text{ or } \frac{35}{14}$$

$$\frac{14}{35} \cdot 20 = ?$$

$$\frac{2 \cdot 7 \cdot 4 \cdot 5}{7 \cdot 5} = 8$$

$$\frac{14}{35} = \frac{x}{20}$$

(37)



SF $A + B = 3:4$

$\frac{3}{4}$
 $A \quad B$
 $12 \cdot SF = x + 6$

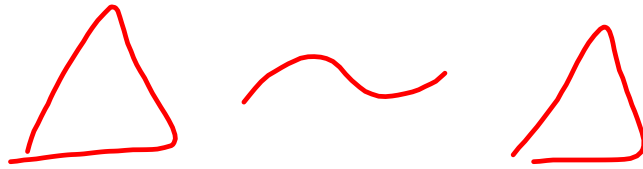
$$12 \cdot \frac{3}{4} = x + 6$$

$$3 \cdot 4 \cdot \frac{3}{4}$$

$$9 = x + 6$$

$$3 = x$$

$$x = 3$$



How

AA

SAS

SSS



Sides must

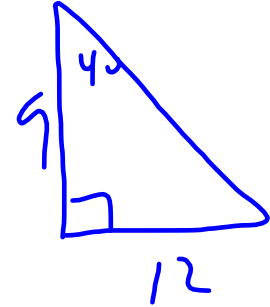
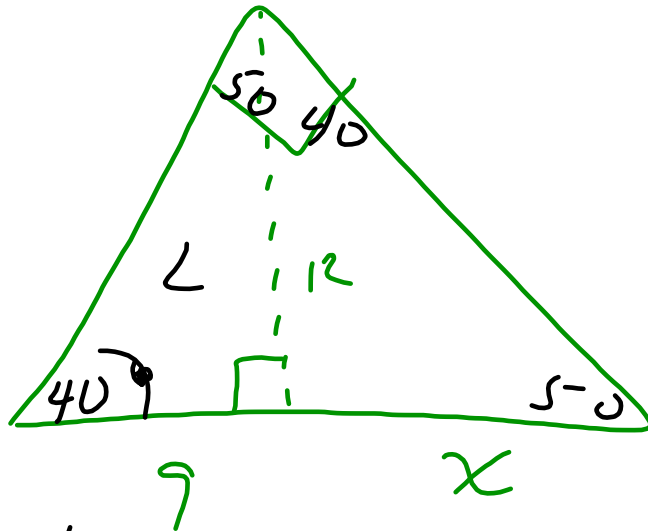
have

same ratio

S.S.

Angles are

|||



$$\frac{50}{40} = \frac{9}{12}$$

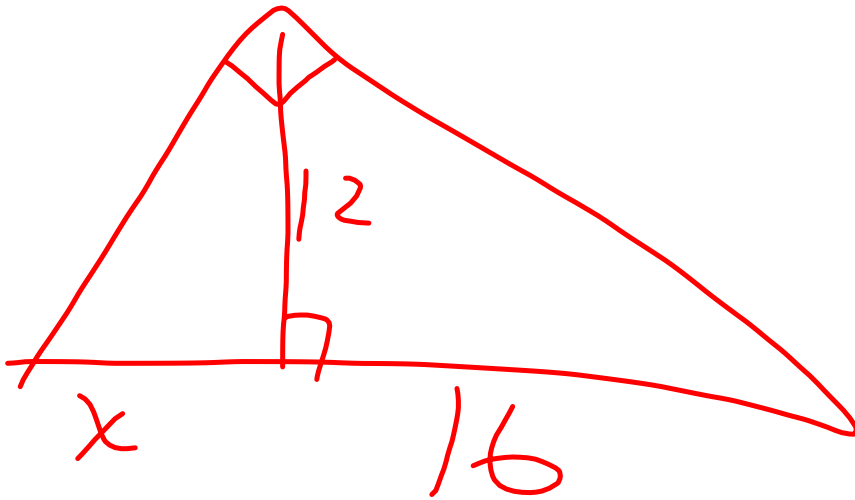
L R
 50 40
 9 12
 x

$$9 \cdot x = 12 \cdot 12$$

$$\frac{9}{x} = \frac{x}{16}$$

$$\frac{8}{7} = \frac{\left(\frac{17}{7}\right) + 1}{3}$$

$$\frac{\frac{24}{7}}{\frac{3}{1}} \quad 8.3 \quad \frac{24}{7} \cdot \frac{1}{3}$$



Shared

$$12^2 = 16 \cdot x$$

$$GM = \sqrt{\underbrace{\text{left segment} \cdot \text{right segment}}_{\text{from base}}}$$