

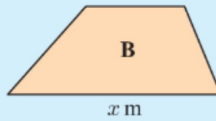
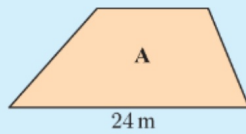
Welcome Back MYP Math 9!

| | Assignment Effort Grade (Circle One) | Comments (What was interesting or challenging?) |
|--|--|---|
| Monday Date: 11/13 Topic: 20E Problem Solving | 0 1 2 | |
| Tuesday Date: _____ Topic: _____ | 0 1 2 | |
| Wednesday Date: _____ Topic: _____ | 0 1 2 | |
| Thursday Date: _____ Topic: _____ | 0 1 2 | |
| Friday Date: _____ Topic: _____ | 0 1 2 | |

Warm-up:

Example 8

Self Tutor



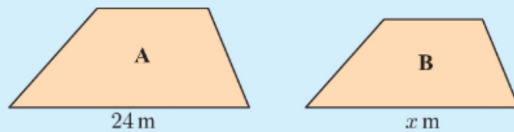
Figures **A** and **B** have areas 160 m^2 and 90 m^2 respectively.

Given that the figures are similar, find x .

Warm-up:

Example 8

Self Tutor



Figures **A** and **B** have areas 160 m^2 and 90 m^2 respectively.

Given that the figures are similar, find x .

Figure **A** is reduced with scale factor k to give figure **B**.

$$\text{Area of B} = k^2 \times \text{area of A}$$

$$\therefore 90 = k^2 \times 160$$

$$\therefore \frac{9}{16} = k^2$$

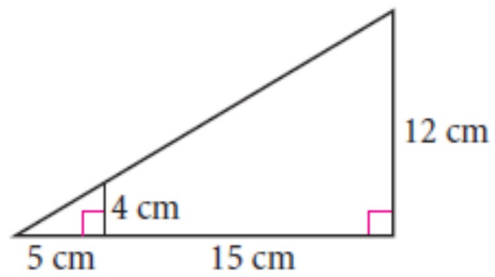
$$\therefore k = \frac{3}{4} \quad \{k > 0\}$$

$$\text{Now } x = \frac{3}{4} \times 24 \quad \{\text{sides in the same ratio}\}$$

$$\therefore x = 18$$

Warm-up:

What's wrong with this picture?



Tomorrow: Unit 3 Quiz 1

Do: Review Problems (in notebook)

NOTE: The handout has many problems!

Start with #1, 5, 7, 11, 12

Done? Extension
Problems of Similar
Objects Handout
(Solutions Posted)



Tomorrow: Unit 3 Quiz 1

6B Rational Equations

(proportions - equal ratios)

20D Similar Figures

20E Problem Solving

20F Area of similar Objects

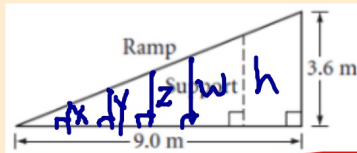
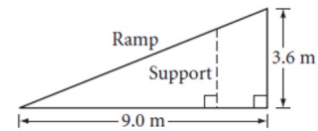
| | | |
|---|--|--|
| 7 | <ul style="list-style-type: none">• Select appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations.• Apply the selected mathematics successfully when solving these problems. | <ul style="list-style-type: none">• All problems are solved without error and detailed work shown. |
| 8 | <ul style="list-style-type: none">• Generally solve these problems correctly. | <ul style="list-style-type: none">-Rational Equation solved algebraically.-Real-life application-Justify the similarity.-Area of similar figures.-Problem solving with similarity. |

Similar Applications:

1) Which is a better buy? A pizza with a 16 inch diameter for \$12.50, or a pizza with a 20-inch diameter for \$20.00? **Justify your answer!**

2)

You need to add 5 supports under the ramp, in addition to the 3.6 m one, so that they are all equally spaced. How long should each support be? (One is drawn in for you.)



$$9/6 = 1.5m$$

$$\frac{X}{1.5} = \frac{3.6}{9} \quad X = .6m$$

$$\frac{Z}{4.5} = \frac{3.6}{9} \quad Z = 1.8m$$

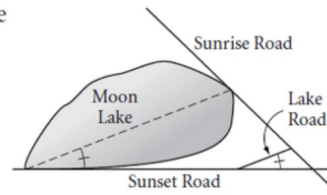
$$\frac{h}{7.5} = \frac{3.6}{9} \quad h = 3m$$

$$\frac{Y}{3} = \frac{3.6}{9} \quad Y = 1.2m$$

$$\frac{W}{6} = \frac{3.6}{9} \quad W = 2.4m$$

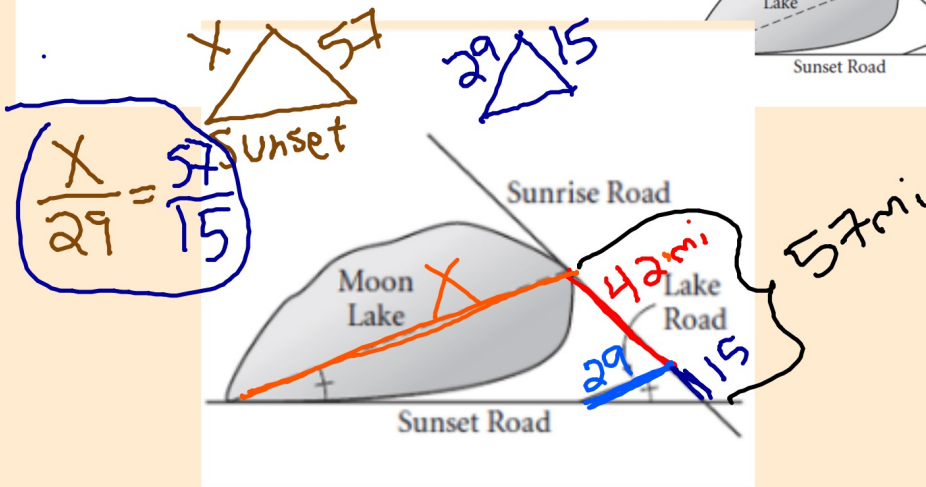
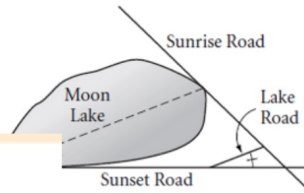
3)

Sunrise Road is 42 miles long between the edge of Moon Lake and Lake Road and 15 miles long between Lake Road and Sunset Road. Lake Road is 29 miles long. Find the length of Moon Lake.



1)

Sunrise Road is 42 miles long between the edge of Moon Lake and Lake Road and 15 miles long between Lake Road and Sunset Road. Lake Road is 29 miles long. Find the length of Moon Lake.

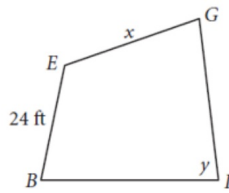
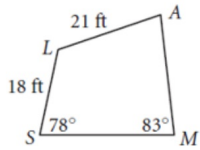


4) Ms. Paulson makes 4 batches of jam each summer. (Each batch consists of *about* 5 pints of jam). Ms. Paulson has been making her own jam for the past 10 years. *About* how many pints of jam has Ms. Paulson made since she started making jam? Ms. Paulson *hopes* to retire from teaching in 25 years. *About* how many pints will Ms. Paulson have made when she retires?

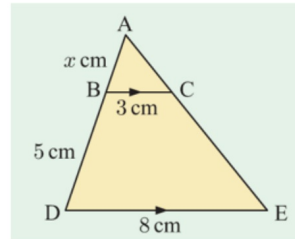
Similar Geometric Figures:

5)

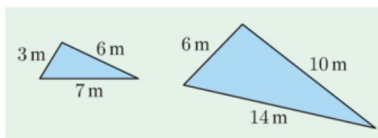
$SMAL \sim BIGE$
Find x and y .



6) Solve for x

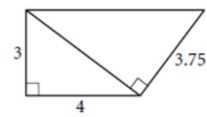


7) Explain why the triangles are **not** similar.



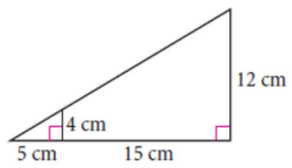
8)

Are the two triangles similar?
Explain why or why not.

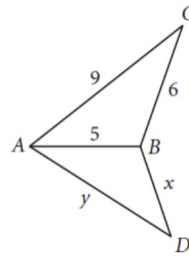


9)

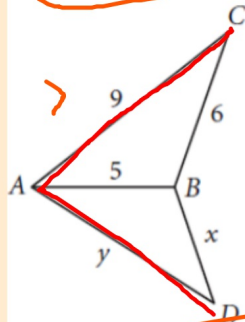
What's wrong with this picture?



10) $\triangle ABC \sim \triangle DBA$. Find x and y .

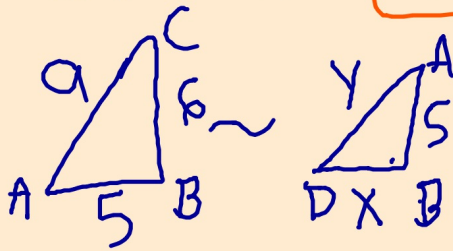


10) $\triangle ABC \sim \triangle DBA$ Find x and y.



$$\frac{BC}{BA} = \frac{AB}{DB} = \frac{5}{x} = \frac{6}{5}$$

$$\frac{AC}{DA} = \frac{9}{y} = \frac{6}{5} = \frac{BC}{BA}$$



11)

$$\frac{9}{6} = \frac{x}{7}$$

12)

$$\frac{9}{5} = \frac{m + 10}{8}$$

13)

$$\frac{2}{7} = \frac{5}{m+8}$$

14)

$$\frac{n-9}{n-8} = \frac{4}{3}$$

15)

$$\frac{1}{v} + \frac{2v - 4}{v} = \frac{1}{2v}$$

16)

$$\frac{5}{6} = \frac{x-4}{6x} + \frac{x-5}{3x}$$

17)

$$\frac{2}{v} = \frac{1}{v} - \frac{4v+4}{5v}$$

18)

$$\frac{1}{4} = \frac{x-1}{4x} - \frac{1}{2}$$

19)

$$\frac{2v-6}{v} = \frac{1}{6} + \frac{v-4}{6}$$

20)

$$\frac{a+1}{a^2} - \frac{a+3}{6a} = \frac{1}{a^2}$$

Solutions

Similar Applications:

- 1) Which is a better buy? A pizza with a 16 inch diameter for \$12.50, or a pizza with a 20-inch diameter for \$20.00? Justify your answer!

COST: $\frac{\$12.50}{16 \text{ in}}$ OR $\frac{\$20}{20 \text{ in}}$
 Diameter: 16 in OR 20 in

16 in for \$12.50 is a better deal.

- 2) $\frac{\$0.78}{1 \text{ in diameter}}$ OR $\frac{\$2}{1 \text{ in diameter}}$

You need to add 5 supports under the ramp, in addition to the 3.6 m one, so that they are all equally spaced. How long should each support be? (One is drawn in for you.)

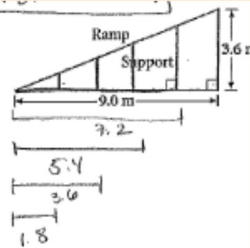
$9/9 = 1.8 \text{ meters}$

$$\frac{3.6}{9} \times \frac{x}{7.2} = 12.88 \text{ m}$$

$$\frac{3.6}{9} = \frac{x}{5.4} = 12.16 \text{ m}$$

$$\frac{3.6}{9} = \frac{x}{3.6} = 11.44 \text{ m}$$

$$\frac{3.6}{9} = \frac{x}{1.8} = 0.72 \text{ m}$$



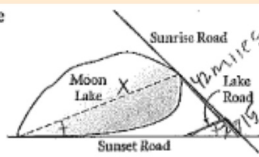
Solutions

Sunrise Road is 42 miles long between the edge of Moon Lake and Lake Road and 15 miles long between Lake Road and Sunset Road. Lake Road is 29 miles long. Find the length of Moon Lake.

$$\frac{42}{15} \times \frac{x}{29}$$

$$\frac{19x}{15} = \frac{1053}{15}$$

$$x = 110.2 \text{ miles}$$



$$x = 110.2$$

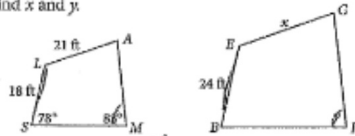
4) Ms. Paulson makes 4 batches of jam each summer. (Each batch consists of about 5 pints of jam). Ms. Paulson has been making her own jam for the past 10 years. About how many pints of jam has Ms. Paulson made since she started making jam? Ms. Paulson hopes to retire from teaching in 25 years. About how many pints will Ms. Paulson have made when she retires?

$$\begin{array}{l} \frac{4 \text{ batches}}{1 \text{ summer}} \times \frac{x \text{ batches}}{10 \text{ summers}} = 40 \text{ batches} \\ \frac{4 \text{ batches} \times 25 \text{ summers} = 100 \text{ more batches}}{\times 5 \text{ pints}} \\ \frac{500 \text{ more pints}}{200 + 500 = 700 \text{ pints}} \end{array}$$

Solutions

Similar Geometric Figures:

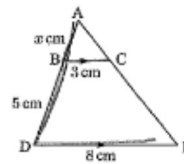
5) $\triangle SMAI \sim \triangle BIGE$
Find x and y .



$$y = 83^\circ$$

$$\frac{18}{24} = \frac{21}{x} \quad \frac{18x = 504}{15} \quad \frac{18x = 504}{18} \quad 1x = 28ft$$

6) Solve for x



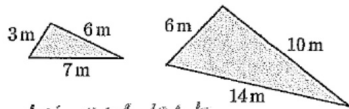
$$\frac{x}{x+5} = \frac{3}{8}$$

$$8x = 3(x+5)$$

$$8x = 3x + 15$$

$$5x = 15 \quad 1x = 3$$

7) Explain why the triangles are not similar.



sides are not proportional so triangles are not similar.

$$\frac{3}{6} = \frac{7}{14} \neq \frac{6}{10}$$

Solutions

9) What's wrong with this picture?

10) $\triangle ABC \sim \triangle DBA$. Find x and y .

Handwritten notes: "proportional", "NOT TO SCALE", "look like 20 cm for making sides unproportional".

Handwritten calculations:

$$\frac{6}{5} = \frac{5}{x}$$

$$25 = 6x$$

$$\frac{25}{6} = x$$

$$4.2 \approx x$$

$$\frac{6}{5} = \frac{9}{y}$$

$$45 = 6y$$

$$\frac{45}{6} = y$$

$$7.5 = y$$

Diagram details: A large triangle ADC is divided by line segment AB . Side $AC = 9$, side $BC = 6$, and side $AB = 5$. In triangle DBA , side $DB = x$ and side $DA = y$. Two smaller triangles are shown: $\triangle ABC$ with sides 5, 6, and 9, and $\triangle DBA$ with sides x , 5, and y .

Solutions

Solving Rational Equations:

11)

$$\frac{9}{6} \times \frac{x}{7}$$

$$9 \cdot 7 = 6x$$

$$\frac{63}{6} = \frac{6x}{6}$$

$$\boxed{10.5 = x}$$

13)

$$\frac{2}{7} \times \frac{5}{m+8}$$

$$7 \cdot 5 = 2(m+8)$$

$$\begin{array}{r} 35 = 2m + 16 \\ -16 \end{array}$$

$$\frac{19}{2} = \frac{2m}{2} \quad \boxed{m = 19/2}$$

12)

$$\frac{9}{5} \times \frac{m+10}{8}$$

$$9 \cdot 8 = 5(m+10)$$

$$\begin{array}{r} 72 = 5m + 50 \\ -50 \end{array}$$

$$\frac{22}{5} = \frac{5m}{5}$$

$$\boxed{4.4 = m} \quad m = 4.4$$

$$\frac{n-9}{n-8} \times \frac{4}{3}$$

$$3(n-9) = 4(n-8)$$

$$\begin{array}{r} 3n - 27 = 4n - 32 \\ -4n + 27 \quad -4n + 27 \end{array}$$

$$\begin{array}{r} -n = -5 \\ \boxed{n = 5} \end{array}$$

Solutions

15) FIND COMMON DENOMINATOR

$$\frac{2}{2} \left(\frac{1}{v} + \frac{2v-4}{v} \right) - \frac{1}{2v}$$
$$\frac{2}{2v} + \frac{4v-8}{2v} = \frac{1}{2v}$$
$$\frac{2}{2v} + \frac{4v-8}{2v} - \frac{2}{2v} = \frac{1}{2v} - \frac{2}{2v}$$
$$\frac{4v-8}{2v} = \frac{-1}{2v}$$
$$4v-8 = -1$$
$$4v = 7$$
$$v = \frac{7}{4}$$
$$\frac{x}{x} \cdot \frac{5}{6} - \frac{x-4}{6x} = \frac{x-5}{3x} \cdot \frac{2}{2}$$
$$\frac{5x}{6x} - \frac{x-4}{6x} = \frac{x-4}{6x} + \frac{2x-10}{6x}$$
$$5x = x-4 + 2x-10$$
$$5x = 3x-14$$
$$2x = -14$$
$$x = -7$$

Solutions

$$\begin{aligned} 17) \quad & \frac{5}{5} \left(\frac{2}{y} - \frac{1}{v} \right) = \frac{4v+4}{5v} \\ & \frac{10}{5v} - \frac{5}{5v} = \frac{4v+4}{5v} \end{aligned}$$

$$10 = 5 - 4v + 4$$

$$10 = 9 - 4v$$

$$\frac{1}{-4} = \frac{-4v}{-4}$$

$$\boxed{\frac{1}{4} = v}$$

18) denominator: $4x$

$$\begin{aligned} & \frac{x}{x} \left(\frac{1}{4} - \frac{x-1}{4x} \right) = \frac{1}{2} \frac{2x}{2x} \\ & \frac{x}{4x} - \frac{x-1}{4x} = \frac{2x}{4x} \end{aligned}$$

$$x = x - 1 - 2x$$

$$+x \quad +x$$

$$2x = 1$$

$$\boxed{x = \frac{1}{2}}$$

Solutions

19)

$$\frac{6}{6} \left(\frac{2v-6}{v} \right) \left(\frac{1}{6} \right) \left(\frac{v-4}{6} \right) \frac{v}{v}$$

$$\frac{1}{6} \left(\frac{12v-36}{6v} \right) \left(\frac{v}{6v} + \frac{v^2-4v}{6v} \right) \frac{6v}{6v}$$

$$12v-36 = v + v^2 - 4v$$

$$12v-36 = v^2-3v$$

$$-12v+36 \quad -12v+36$$

$$0 = v^2-15v+36$$

$$0 = (v-3)(v-12)$$

$$\begin{array}{r|l} x-3 & 0 \\ \hline +3 & +3 \end{array} \quad \begin{array}{r|l} x-12 & 0 \\ \hline +12 & +12 \end{array}$$

$$x=3 \quad x=12$$

20)

$$\frac{6}{6} \left(\frac{a+1}{a^2} \right) \left(\frac{a+3}{6a} \right) \left(\frac{1}{a^2} \right) \frac{6}{6}$$

$$\frac{6a^2(a+6) - a^2+3a}{6a^2} = \frac{6}{6a^2}$$

$$6a+6-a^2+3a = 6$$

$$-a^2+9a+6 = 6$$

$$-a^2+9a = 0$$

$$a^2-9a = 0$$

$$a(a-9) = 0$$

$$a=0 \quad a-9=0$$

$$a=9$$

Exercises...

Study! :)

Review Handout

Tomorrow...Quiz 3.1