

Version A

1. Solve the proportion for x.

$$\frac{x-4}{10} = \frac{6}{4}$$

$$10 \cdot 6 = 60$$

$$4(x-4)$$

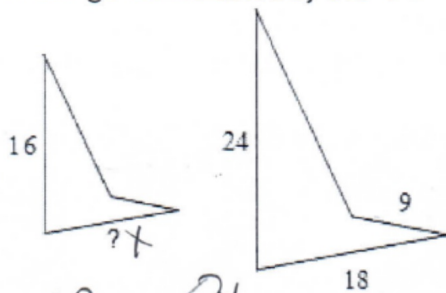
$$4x - 16 = 60$$

$$+16 \quad +16$$

$$\frac{4x}{4} = \frac{76}{4} \quad \boxed{x=19}$$

Version A

2. The two shapes below are similar. Find the missing side indicated by the “?”.

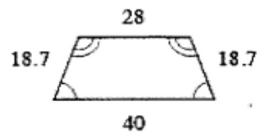
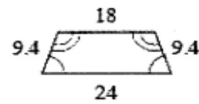


$$\frac{16}{24} = \frac{?x}{18}$$

$$16(18) = 24x$$
$$\frac{288}{24} = \frac{24x}{24}$$
$$x = 12$$

Version A

3. Determine if the polygons are similar. Defend your answer using algebra and appropriate vocabulary.



no they
are not
similar

$$\frac{18}{28} = \frac{24}{40}$$

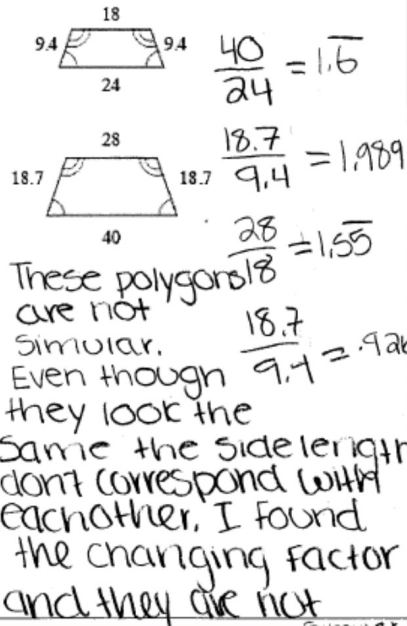
$$672 \neq 720$$

↑ The side lengths
don't go up by
the same
factor

"the side
lengths don't
go up by the
same scale
factor"

Version A

3. Determine if the polygons are similar.
Defend your answer using algebra and appropriate vocabulary.



The image shows two trapezoids. The first trapezoid has a top base of 18, a bottom base of 24, and two slanted sides of 9.4. The second trapezoid has a top base of 28, a bottom base of 40, and two slanted sides of 18.7. Handwritten calculations show the ratios of corresponding sides: $\frac{40}{24} = 1.6$, $\frac{18.7}{9.4} = 1.989$, and $\frac{28}{18} = 1.55$. The student concludes that the polygons are not similar because the ratios do not match.

These polygons are not similar. Even though they look the same the side lengths don't correspond with each other. I found the changing factor and they are not

$\frac{40}{24} = 1.6$

$\frac{18.7}{9.4} = 1.989$

$\frac{28}{18} = 1.55$

$\frac{18.7}{9.4} = 1.989$

Version A

4. Pascal is standing in front of the Foshay Tower in downtown Minneapolis. (The tower is about 440 feet and casts a shadow of 630 ft.) His shadow is in line with the shadow of the tower. Pascal's shadow is 8.6 feet. What is his height? (Diagram is not drawn to scale).

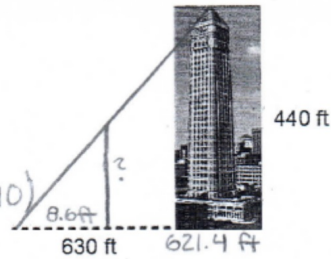
$$\frac{440}{630} = \frac{x}{8.6}$$

$$630x = 8.6(440)$$

$$\frac{630x}{630} = \frac{3784}{630}$$

$$x \approx 6.01$$

Pascal is about
6 feet tall



Version A

4. Pascal is standing in front of the Foshay Tower in downtown Minneapolis. (The tower is about 440 feet and casts a shadow of 630 ft.) His shadow is in line with the shadow of the tower. Pascal's shadow is 8.6 feet. What is his height? (Diagram is not drawn to scale).

$$\frac{440}{630} = \frac{X}{8.6}$$



$$\begin{aligned} 440(8.6) &= 630(X) \\ 3784 &= 630X \\ \frac{3784}{630} &= \frac{630X}{630} \\ 6.0 &= X \end{aligned}$$

Pascal is
6 ft tall

Version B

1. Solve the proportion for x.

$$\frac{3}{2} = \frac{6}{x-9}$$

$$\left. \begin{array}{l} 3(x-9) = 6(2) \\ 3x - 27 = 12 \\ 3x = 39 \\ x = 13 \end{array} \right\} \frac{3}{2} = \frac{6}{13-9}$$

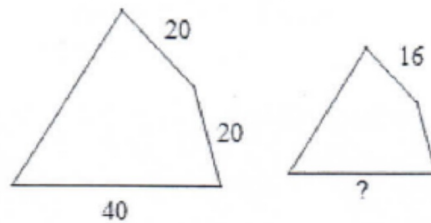
Version B

1. Solve the proportion for x.

$$\frac{3}{2} = \frac{6}{x-9}$$
$$3(x-9) = 12$$
$$3x - 27 = 12$$
$$+27 \quad +27$$
$$\frac{3x}{3} = \frac{39}{3}$$
$$x = 13$$

Version B

2. The two shapes below are similar. Find the missing side indicated by the "?".



$$\frac{20}{16} = \frac{40}{x}$$

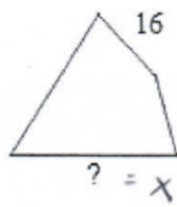
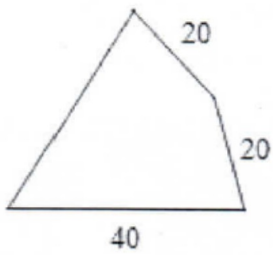
$$20x = 16(40)$$
$$20x = 640$$

$$\frac{20x}{20} = \frac{640}{20}$$

$$x = 32$$

Version B

2. The two shapes below are similar. Find the missing side indicated by the "?".



$$\frac{20}{40} \neq \frac{16}{x}$$

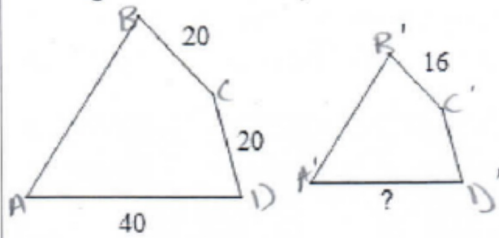
$$16 \cdot 40 = 20x$$

$$\frac{640}{20} = \frac{20x}{20}$$

$$x = 32$$

Version B

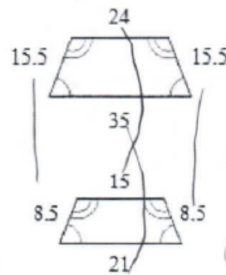
2. The two shapes below are similar. Find the missing side indicated by the "?".



$$\frac{BC}{B'C'} = \frac{AD}{A'D'} \Rightarrow \frac{20}{16} = \frac{40}{x}$$
$$20x = 16 \times 40$$
$$20x = 640$$
$$\frac{20}{16} = 1.25 \quad \frac{40}{32} = 1.25$$
$$x = 32$$

Version B

3. Determine if the polygons are similar.
Defend your answer using algebra and appropriate vocabulary.



They are not proportional because they have different ratios.

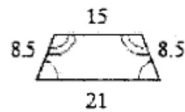
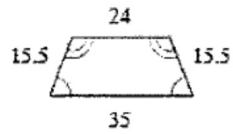
$$\frac{15.5}{8.5} = 1.7 \quad \frac{15.5}{8.5} = 1.7$$

$$\frac{24}{15} = 1.6$$

$$\frac{35}{21} = 1.67$$

Version B

3. Determine if the polygons are similar.
Defend your answer using algebra and appropriate vocabulary.



$$\frac{24}{15} = 1.6$$

$$\frac{15.5}{8.5} = 1.8$$

$$\frac{35}{21} = 1.66$$

The polygons are not similar because they have different ratios.

Version B

4. Beta is standing in front of the Foshay Tower in downtown Minneapolis. (The tower is about 450 feet and casts a shadow of 640 ft.) Her shadow is in line with the shadow of the tower. Beta's shadow is 6.8 feet. What is her height? (Diagram is not drawn to scale).



450 ft

640 ft

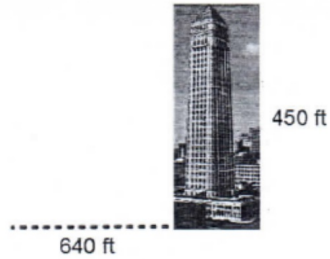
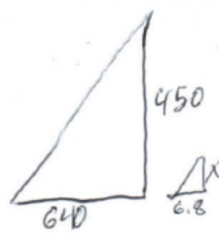
$$\frac{450}{640} = \frac{x}{6.8}$$

$$\frac{640x}{640} = \frac{3060}{640}$$

$$x = 4.78125 \text{ ft.}$$

Version B

4. Beta is standing in front of the Foshay Tower in downtown Minneapolis. (The tower is about 450 feet and casts a shadow of 640 ft.) Her shadow is in line with the shadow of the tower. Beta's shadow is 6.8 feet. What is her height? (Diagram is not drawn to scale).



$$\frac{6.8}{640} = \frac{x}{450}$$

$$6.8 \cdot 450 = 3060$$
$$640 \cdot x = 640x$$

$$\rightarrow \frac{640x = 3060}{640} \quad \frac{3060}{640}$$



$$x = 4.8 \text{ ft.}$$

She is 4.8 ft.
tall!