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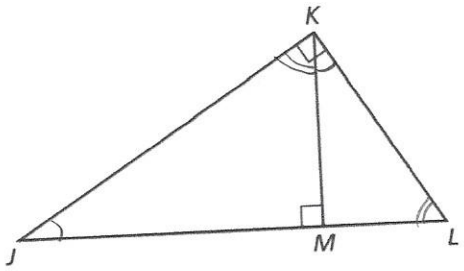
LESSON 12-4

Similarity in Right Triangles

Practice and Problem Solving: A/B

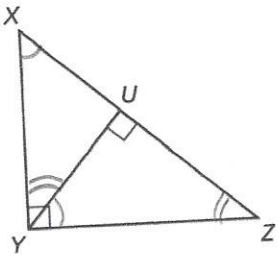
In Exercises 1 and 2, write similarity statements for the three similar triangles. It might help to draw them side-by-side.

1.



$\triangle JKL \sim \triangle JMK \sim \triangle KML$

2.



$\triangle XYZ \sim \triangle XUY \sim \triangle YUZ$

Find the geometric mean of each pair of numbers. If necessary, round to the nearest tenth.

6. $\frac{1}{4}$ and 4

$\sqrt{\frac{1}{4} \cdot 4} = 1$

7. 3 and 75

$\sqrt{3 \cdot 75} = 15$

8. 4 and 18

$\sqrt{4 \cdot 18} = \sqrt{72} = 8.5$

9. $\frac{1}{2}$ and 9

$\sqrt{\frac{1}{2} \cdot 9} = \sqrt{4.5} = 2.1$

10. 10 and 14

$\sqrt{10 \cdot 14} = \sqrt{140} = 11.8$

11. 4 and 12.25

$\sqrt{4 \cdot 12.25} = 7$

12. 3 and 12

$\sqrt{3 \cdot 12} = 6$

13. 4 and 14

$\sqrt{4 \cdot 14} = \sqrt{56} = 7.5$

14. 10 and 24

$\sqrt{24 \cdot 10} = \sqrt{240} = 15.5$

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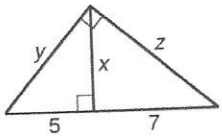
Find *x*, *y*, and *z*.

15.



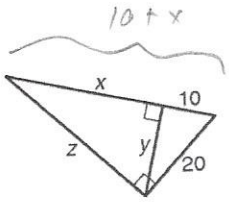
$\frac{x}{5} = \frac{7}{x}$ $\quad x = \sqrt{35} = 5.9$

$\frac{y}{5} = \frac{12}{y}$ $\quad y = \sqrt{60} = 7.7$

$\frac{z}{7} = \frac{12}{z}$

$z = \sqrt{84} = 9.2$

16.



$\frac{20}{10} = \frac{10+x}{20}$

$10(10+x) = 400$

$100 + 10x = 400$

$10x = 300$

$x = 30$

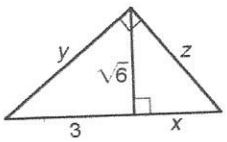
$\frac{y}{30} = \frac{10}{y}$

$y = \sqrt{300} = 17.3$

$\frac{z}{30} = \frac{40}{z}$

$z = \sqrt{1200} = 34.6$

17.



$\frac{\sqrt{6}}{3} = \frac{x}{\sqrt{6}}$

$3x = 6$

$x = 2$

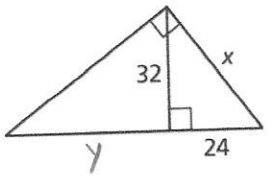
$\frac{y}{3} = \frac{5}{y}$

$y = \sqrt{15} = 3.9$

$\frac{z}{2} = \frac{5}{z}$

$z = \sqrt{10} = 3.2$

18.



$\frac{32}{y} = \frac{24}{32}$

$24y = 1024$

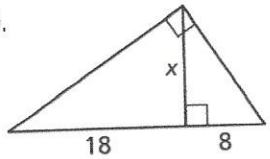
$y = 42.7$

$\frac{x}{24} = \frac{66.7}{x}$

$x = \sqrt{1600}$

$x = 40$

19.

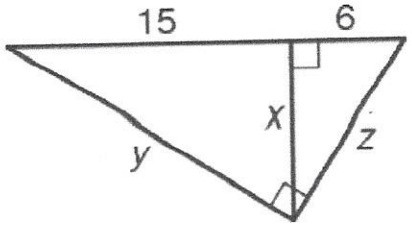


$\frac{x}{8} = \frac{18}{x}$

$x = \sqrt{144}$

$x = 12$

20.



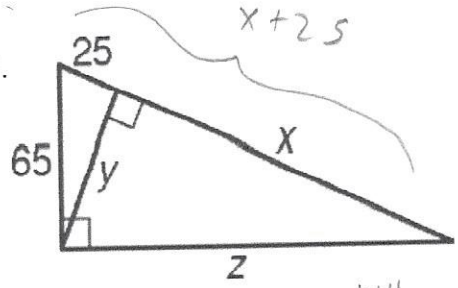
$\frac{x}{15} = \frac{6}{x}$ $\quad x = \sqrt{90} = 9.5$

$\frac{y}{15} = \frac{21}{y}$ $\quad y = \sqrt{315} = 17.7$

$\frac{z}{6} = \frac{21}{z}$

$z = \sqrt{126} = 11.2$

21.



$\frac{65}{25} = \frac{x+25}{65}$

$25(x+25) = 4225$

$25x + 625 = 4225$

$25x = 3600$

$x = 144$

$\frac{y}{25} = \frac{144}{y}$

$y = \sqrt{3600} = 60$

$\frac{z}{144} = \frac{169}{z}$

$z = \sqrt{24336} = 156$

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Find the geometric mean of each pair of numbers. If necessary, round to the nearest tenth.

4. 5 and 20

$\sqrt{5 \cdot 20} = 10$

5. 3 and 12

$\sqrt{3 \cdot 12} = 6$

6. 8 and 13

$\sqrt{8 \cdot 13} = 10.2$

7. 3.5 and 20

$\sqrt{3.5 \cdot 20} = 8.4$

8. 1.5 and 84

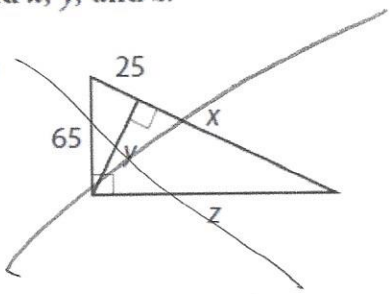
$\sqrt{1.5 \cdot 84} = 11.2$

9. $\frac{2}{3}$ and $\frac{27}{40}$

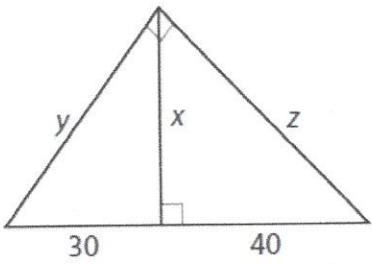
$\sqrt{\frac{2}{3} \cdot \frac{27}{40}} = .7$

Find x, y, and z.

10.



11.



$\frac{x}{40} = \frac{30}{x}$

$x = \sqrt{1200} = 34.6$

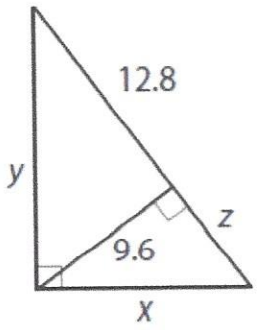
$\frac{y}{30} = \frac{70}{y}$

$y = \sqrt{2100} = 45.8$

$\frac{z}{40} = \frac{70}{z}$

$z = \sqrt{2800} = 52.9$

12.



$\frac{9.6}{z} = \frac{12.8}{9.6}$

$12.8z = 92.16$

$z = 7.2$

$\frac{x}{7.2} = \frac{20}{x}$

$x = \sqrt{144} = 12$

$\frac{y}{12.8} = \frac{20}{y}$

$y = \sqrt{256} = 16$

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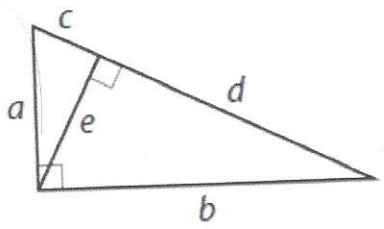
Use the diagram to complete each equation.



13. $\frac{c}{e} = \frac{e}{d}$

14. $\frac{c}{a} = \frac{a}{c+d}$

15. $\frac{c+d}{b} = \frac{b}{d}$

16. $\frac{d}{e} = \frac{e}{c}$