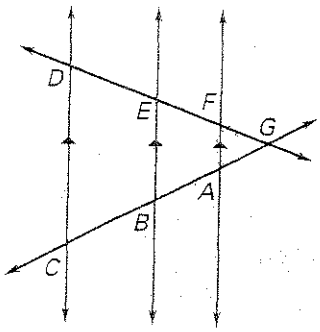
Adv. Geometry 6.6 - Proportionality Theorems Key

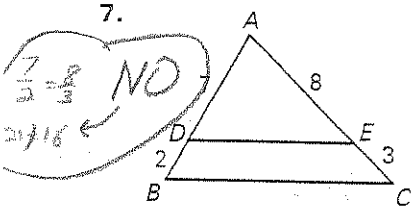
Use the figure to complete the proportion.

1. $\frac{EF}{FG} = \frac{BA}{?}$ AG
2. $\frac{CB}{BA} = \frac{?}{EF}$ DE
3. $\frac{EB}{FA} = \frac{?}{FC}$ EG
4. $\frac{EG}{ED} = \frac{?}{CB}$ BG
5. $\frac{DC}{FA} = \frac{?}{AG}$ CG
6. $\frac{GF}{FA} = \frac{GD}{?}$ DC

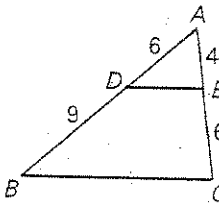


Determine whether the given information implies $\overline{BC} \parallel \overline{DE}$. Explain.

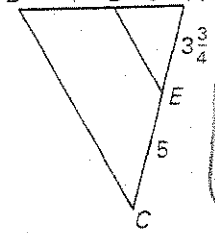
7. $\frac{2}{3} = \frac{8}{3}$ NO
$2 \neq 16$



8. $\frac{6}{9} = \frac{4}{6}$
$36 = 36$
Yes

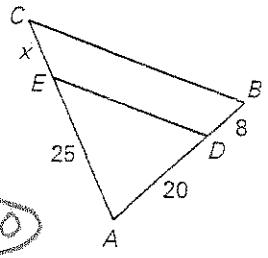


9. $\frac{3}{4} = \frac{15}{4\frac{1}{5}}$
$15 = 15$
Yes

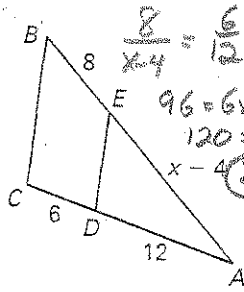


Determine a value of the variable so that $\overline{DE} \parallel \overline{BC}$.

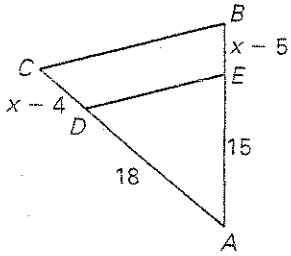
10. $\frac{x}{25} = \frac{8}{20}$
$x = \frac{200}{20}$
$X = 10$



11. $\frac{8}{x-4} = \frac{6}{12}$
$96 = 6x - 24$
$120 = 6x$
$20 = x$

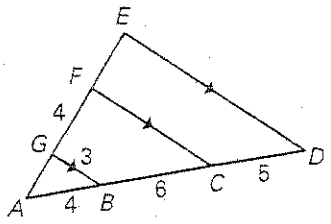


12. $\frac{x-4}{18} = \frac{x-5}{15}$
$15x - 60 = 18x - 90$
$30 = 3x$
$10 = x$



Determine the length of each segment.

13. $\overline{AG} = \frac{3}{3}$
14. $\overline{FC} = \frac{15}{2}$ $\frac{FC}{3} = \frac{10}{4}$ $FC = \frac{30}{4}$
15. $\overline{ED} = \frac{45}{4}$
16. $\overline{AE} = 10$



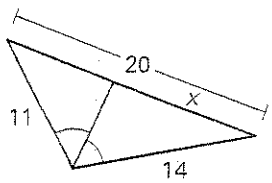
$\frac{AG}{4} = \frac{4}{6}$ $AG = \frac{16}{6} = \frac{8}{3}$

$\frac{ED}{5} = \frac{15}{4}$ $ED = \frac{45}{4}$

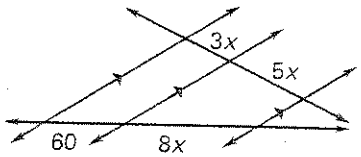
$\frac{AE}{4} = \frac{15}{6} \rightarrow AE = \frac{60}{6} = 10$

Find the value of the variable.

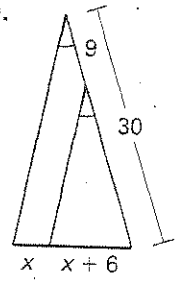
17. $\frac{x}{20-x} = \frac{14}{11}$
$11x = 280 - 14x$
$25x = 280$
$x = \frac{280}{25} = 11.2$



18. $\frac{5x}{3x} = \frac{8x}{60}$
$\frac{5}{3} = \frac{8x}{60}$
$\frac{300}{24} = \frac{24x}{24}$
$x = 12.5$



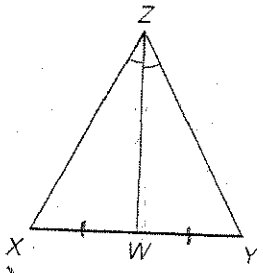
19. $\frac{30}{9} = \frac{2x+6}{x}$
$30x = 18x + 54$
$12x = 54$
$x = \frac{54}{12} = \frac{9}{2} = x$



21. Proof Write a two-column or paragraph proof.

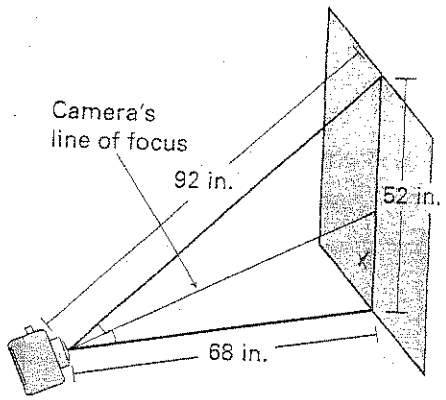
GIVEN: $\overline{WZ}$ bisects $\angle XZY$.

PROVE: $XZ = ZY$



① $\overline{WZ}$ bisects $\angle XZY$	① Given
② $\overline{XW} \cong \overline{YW}$	② Given in picture
③ $\frac{XW}{YW} = \frac{XZ}{YZ}$	③ Theorem 6.7 (∠ bisector Proportion theorem)
④ $1 = \frac{XZ}{YZ}$	④ Division property ($XW = YW$)
⑤ $ZY = XZ$	⑤ Multiplication property of Eq.

22. Photography You take a picture of a painting at an art gallery. The painting is above eye level, and you frame the painting so the top and bottom match up with the top and bottom of your view finder. Your camera's auto-focus feature focuses at the height of the angle bisector shown in the diagram. How far from the bottom of the painting is the focus?



$$\frac{x}{52-x} = \frac{68}{92}$$

$92x = 3536 - 68x$

$160x = 3536$

$x = 22.1$ "