Name ______________________ Class ____________ Date ____________

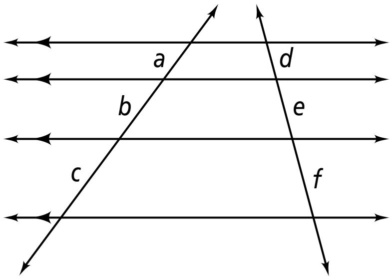
Practice

Form G

Proportions in Triangles

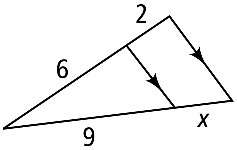
Use the figure at the right to complete each proportion.

1. $\frac{a}{c} = \frac{\boxed{d}}{f}$
2. $\frac{f}{e} = \frac{c}{\boxed{b}}$
3. $\frac{\boxed{b}}{c} = \frac{e}{f}$
4. $\frac{a}{\boxed{d}} = \frac{b}{e}$
5. $\frac{a}{b} = \frac{\boxed{d}}{e}$
6. $\frac{e}{\boxed{b}} = \frac{f}{c}$

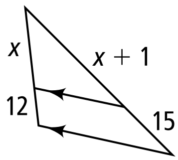


Algebra **Solve for *x*.**

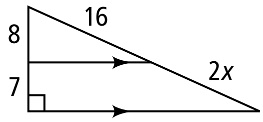
7. 3



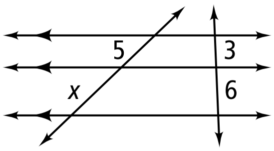
8. 4



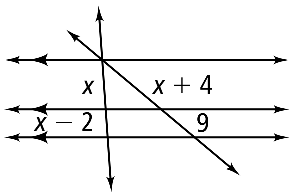
9. 7



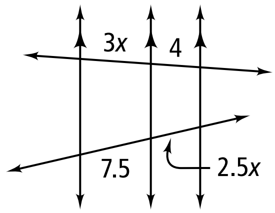
10. 10



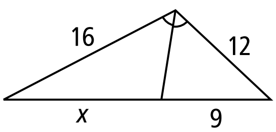
11. 8



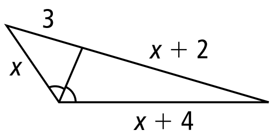
12. 2



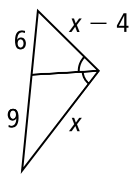
13. 12



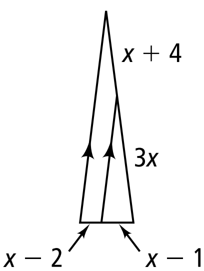
14. 4



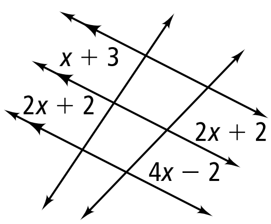
15. 12



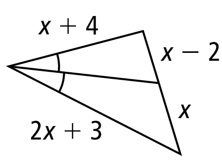
16. 4



17. 5



18. 6



Name ______________________ Class ____________ Date ____________

Practice (continued) *Form G*

Proportions in Triangles

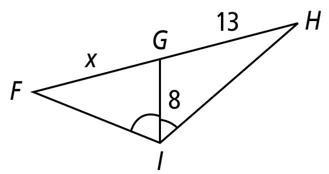
19. Compare and Contrast How is the Triangle-Angle-Bisector Theorem similar to Corollary 2 of Theorem 62? How is it different?

Answers may vary. Sample: Both relate to a line that intercepts an angle of a triangle and its opposite side. In both, the segments created by the intersecting line are related proportionally to the sides of the triangle. Corollary 2 of Theorem 62 is only true of right triangles with an altitude to the hypotenuse. The Triangle-Angle-Bisector Theorem relates to all triangles that contain an angle bisector that intersects the opposite side.

20. Reasoning In $\triangle FGH$, the bisector of $\angle F$ also bisects the opposite side. The ratio of each half of the bisected side to each of the other sides is 1 : 2. What type of triangle is $\triangle FGH$? Explain.

$\triangle FGH$ is an equilateral triangle. Because the side has been bisected, each segment is the same length. So, their sum is: $x + x = 2x$. This is the same as the length of a side.

21. Error Analysis Your classmate says you can use the Triangle-Angle-Bisector Theorem to find the value of x in the diagram. Explain what is wrong with your classmate's statement.

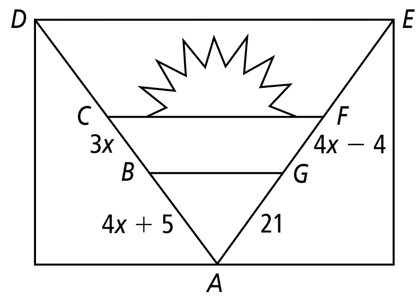


The classmate is confusing this Theorem with Corollary 1 to Theorem 62. You could only find the value of x if $\triangle FHI$ were a right triangle with right $\angle I$, and $\overline{IG}$ were an altitude to the hypotenuse.

22. Reasoning An angle bisector of a triangle divides the opposite side of the triangle into segments 3 in. and 6 in. long. A second side of the triangle is 5 in. long. Find the length of the third side of the triangle. Explain how you arrived at the correct length.

10 in.; The other possible side length is 2.5 in., but because 2.5 in. + 5 in. < 9 in., it violates the Triangle Inequality Theorem.

23. The flag of Antigua and Barbuda is like the image at the right. In the image, $\overline{DE} \parallel \overline{CF} \parallel \overline{BG}$.



a. An artist has made a sketch of the flag for a mural. The measures indicate the length of the lines in feet. What is the value of x? **4**

b. What type of triangle is $\triangle ACF$? Explain.

$\triangle ACF$ is isosceles. Because $x = 4$, $\overline{CB} \cong \overline{FG}$ and $\overline{BA} \cong \overline{GA}$. Because $CA = CB + BA$ and $FA = FG + GA$, by substitution $\overline{CA} \cong \overline{FA}$.

c. Given: $\overline{DE} \parallel \overline{CF} \parallel \overline{BG}$

Prove: $\triangle ABG \sim \triangle ACF \sim \triangle ADE$

Statements: 1) $\overline{DE} \parallel \overline{CF} \parallel \overline{BG}$;
2) $\angle EDC \cong \angle FCB \cong \angle GBA$;
3) $\angle DEF \cong \angle CFG \cong \angle BGA$;
4) $\triangle ABG \sim \triangle ACF \sim \triangle ADE$;
Reasons: 1) Given; 2) If lines are $\parallel$, corresponding $\angle$s are $\cong$; 3) If lines are $\parallel$, corresponding $\angle$s are $\cong$; 4) AA $\sim$