Chapter Summary

1. The ratio of a to b is the quotient $\frac{a}{b}$ (b cannot be 0). The ratio $\frac{a}{b}$ can also be written $a:b$.
2. A proportion is an equation, such as $\frac{a}{b} = \frac{c}{d}$, stating that two ratios are equal.
3. The properties of proportions (see page 209) are used to change proportions into equivalent equations. For example, the product of the extremes equals the product of the means.
4. Similar figures have the same shape. Two polygons are similar if and only if corresponding angles are congruent and corresponding sides are in proportion.
5. Ways to prove two triangles similar:
   AA Similarity Postulate SAS Similarity Theorem SSS Similarity Theorem
6. Ways to show that segments are proportional:
   a. Corresponding sides of similar polygons are in proportion.
   b. If a line is parallel to one side of a triangle and intersects the other two sides, then it divides those sides proportionally.
   c. If three parallel lines intersect two transversals, they divide the transversals proportionally.
   d. If a ray bisects an angle of a triangle, then it divides the opposite side into segments proportional to the other two sides.

Chapter Review

Write the ratio in simplest form.

1. 15:25 **2.** 6:12:9 **3.** $\frac{16xy}{24x^2}$ **5-1**

4. The measures of the angles of a triangle are in the ratio 4:4:7. Find the three measures.

Is the equation equivalent to the proportion $\frac{30 - x}{x} = \frac{8}{7}$?

5. $7x = 8(30 - x)$ **6.** $\frac{x}{30 - x} = \frac{7}{8}$ **5-2**

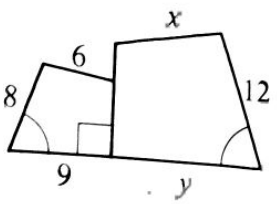
7. $8x = 210 - 7x$ **8.** $\frac{30}{x} = \frac{15}{7}$

9. If $\triangle ABC \sim \triangle NJT$, then $\angle B \cong$ ___?___.

10. If quad. $DEFG \sim$ quad. $PQRS$, then $\frac{FG}{RS} = \frac{GD}{?}$. 5-3

11. $\triangle ABC \sim \triangle JET$, and the scale factor of $\triangle ABC$ to $\triangle JET$ is $\frac{5}{3}$. If $BC = 20$, then $ET =$ ___?___.

12. The quadrilaterals are similar. Find the values of x and y.



13. a. $\triangle RTS \sim$ ___?___

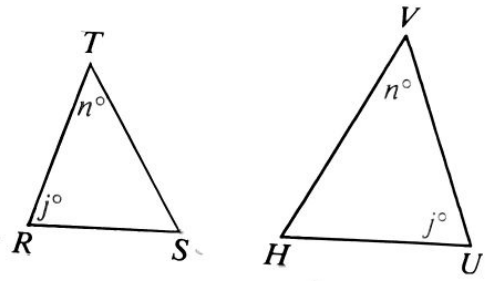
b. What postulate or theorem justifies the statement in part (a)? 5-4

14. $\frac{RT}{?} = \frac{TS}{?} = \frac{RS}{?}$

15. Suppose you wanted to prove

$$RS \cdot UV = RT \cdot UH.$$

You would first use similar triangles to show that $\frac{RS}{?} = \frac{?}{?}$.



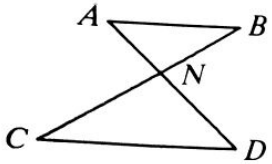
If two triangles shown can be proved similar, state the similarity. If not, write *no*.

16. $\angle A \cong \angle D$

17. $\angle B \cong \angle D$

18. $CN = 16$, $ND = 14$, $BN = 7$, $AN = 8$

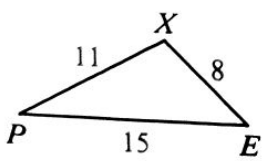
19. $AN = 7$, $AB = 6$, $DN = 14$, $DC = 12$

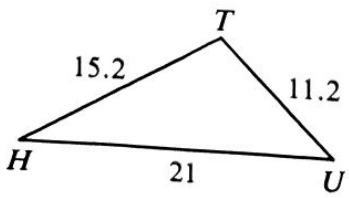


5-5

Exs. 16–19

20.



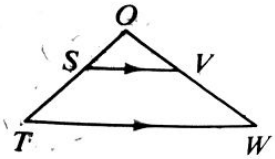


21. Which proportion is *incorrect*?

(1) $\frac{OS}{ST} = \frac{OV}{VW}$ (2) $\frac{SV}{TW} = \frac{OS}{ST}$ (3) $\frac{OT}{OW} = \frac{OS}{OV}$ 5-6

22. If $OS = 8$, $ST = 12$, and $OV = 10$, then $OW =$ ___?___.

23. If $OS = 8$, $ST = 12$, and $OW = 24$, then $VW =$ ___?___.



24. In $\triangle ABC$, the bisector of $\angle B$ meets $\overline{AC}$ at K. $AB = 18$, $BC = 24$, and $AC = 28$. Find AK.