Cumulative Review: Chapters 1–13

A

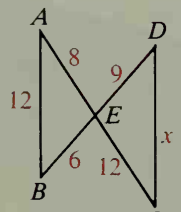
1. $\overrightarrow{BD}$ bisects $\angle ABC$, $m\angle ABC = 5x - 4$, and $m\angle CBD = \frac{3}{2}x + 21$. Is $\angle ABC$ acute, obtuse, or right?

2. Name five ways to prove that two lines are parallel.

3. If the diagonals of a quadrilateral are congruent and perpendicular, must the quadrilateral be a square? a rhombus? Draw a diagram to illustrate your answer.

4. Write "$x = 1$ only if $x \neq 0$" in if-then form. Then write the contrapositive and classify the contrapositive as true or false.

5. Refer to the diagram.
a. Show that $\angle B \cong \angle D$.
b. Find the value of x.
c. Find the ratio of the areas of the triangles.



Ex. 5

6. Is a triangle with sides of lengths 12, 35, and 37 acute, right, or obtuse?

7. In $\triangle ABC$, $\overline{AB} \perp \overline{BC}$, $AB = 1$, and $AC = 3$. Find:
a. $\cos A$ **b.** $\sin C$ **c.** $\tan A$ **d.** $\cos C$

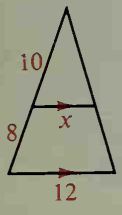
8. Find the perimeter and area of a regular hexagon with apothem $\sqrt{3}$ cm.

9. Find the total area and volume of a cylinder with radius 10 and height 8.2.

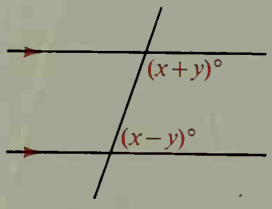
10. Describe the locus of the centers of all circles tangent to each of two given parallel lines.

Find the value of x.

11.



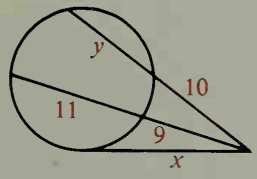
12.



13.

B

14. If x is the length of a tangent segment in the diagram, find the values of x and y.



15. Prove: If the ray that bisects an angle of a triangle is perpendicular to the side that it intersects, then the triangle is an isosceles triangle.

16. Draw an obtuse triangle. Construct a circumscribed circle about the triangle.

17. Use coordinate geometry to prove that the median of a trapezoid is parallel to each base.