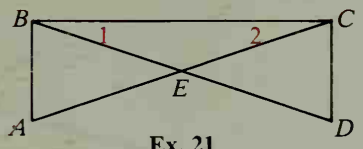
B **21.** Given: $\overline{AB} \perp \overline{BC}$; $\overline{DC} \perp \overline{BC}$; $\overline{AC} \cong \overline{BD}$
Prove: $\triangle BCE$ is isosceles.

22. Given: Quad. $EFGH$; $\overline{EF} \cong \overline{HG}$; $\overline{EF} \parallel \overline{HG}$
Prove: $\angle EHF \cong \angle GFH$



Ex. 21

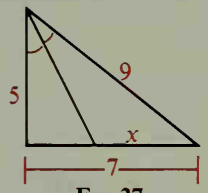
23. Use an indirect proof to show that no triangle has sides of length x, y, and $x + y$.

24. The legs of a right triangle are 4 cm and 8 cm long. What is the length of the median to the hypotenuse?

25. If a 45°-45°-90° triangle has legs of length $5\sqrt{2}$, find the length of the altitude to the hypotenuse.

26. The altitude to the hypotenuse of a 30°-60°-90° triangle divides the hypotenuse into segments with lengths in the ratio $\_\_?\_\_ : \_\_?\_\_$.

27. Find the value of x in the diagram.



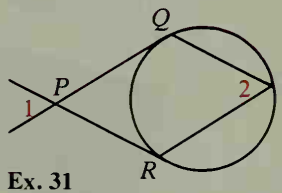
Ex. 27

28. In $\triangle DEF$, $m\angle F = 42$, $m\angle E = 90$, and $DE = 12$. Find EF to the nearest integer. (Use the table on page 311.)

29. In right $\triangle XYZ$ with hypotenuse $\overline{XZ}$ if $\cos X = \frac{7}{10}$ and $XZ = 24$, then to the nearest integer $XY = \_\_?\_\_$.

30. If a tree is 20 m high and the distance from point P on the ground to the base of the tree is also 20 m, then the angle of elevation of the top of the tree from point P is $\_\_?\_\_$.

31. If $\overline{PQ}$ and $\overline{PR}$ are tangents to the circle and $m\angle 1 = 58$, find $m\angle 2$.



Ex. 31

32. $\triangle ABC$ is an isosceles right triangle with hypotenuse $\overline{AC}$ of length $2\sqrt{2}$. If medians $\overline{AD}$ and $\overline{BE}$ intersect at M, find AD and AM.

33. Draw two segments and let their lengths be x and y. Construct a segment of length t such that $t = \frac{2x^2}{y}$.

34. An equilateral triangle has perimeter 12 cm. Find its area.

35. Find the area of an isosceles trapezoid with legs 7 and bases 11 and 21.

36. **a.** Find the length of a 200° arc in a circle with diameter 24.
b. Find the area of the sector determined by this arc.

37. B and E are the respective midpoints of $\overline{AC}$ and $\overline{AD}$. Given that $AB = 9$, $BE = 6$, and $AE = 8$, find:
a. the perimeter of $\triangle ACD$
b. the ratio of the areas of $\triangle ABE$ and $\triangle ACD$