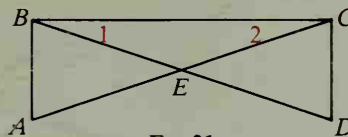


- B** 21. Given: $\overline{AB} \perp \overline{BC}$; $\overline{DC} \perp \overline{BC}$; $\overline{AC} \cong \overline{BD}$

Prove: $\triangle BCE$ is isosceles.



Ex. 21

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

Prove: $\angle EHF \cong \angle GFH$

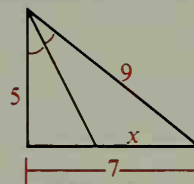
23. Use an indirect proof to show that no triangle has sides of length x , y , and $x + y$.

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 $\frac{?}{?} : \frac{?}{?}$.

27. Find the value of x in the diagram.



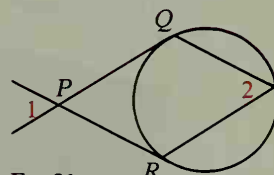
Ex. 27

28. In $\triangle DEF$, $m\angle F = 42^\circ$, $m\angle E = 90^\circ$, 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 $XY = \frac{?}{?}$.

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 $\frac{?}{?}$.

31. If \overline{PQ} and \overline{PR} are tangents to the circle and $m\angle 1 = 58^\circ$, 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 $\triangle ACD$

