1. 120 **2.** 47 **3.** 30 **4.** 14.04 in.

5. Extend $\overline{RS}$ and $\overline{QP}$ until they meet at a point, H. By Thm. 11-3, $RH = QH$, or $SH + RS = QP + PH$. By 11-3 again, $SH = PH$. Thus, $RS = QP$.

6. 15.2 cm **7.** 20.0 in.

8. No; $5^2 + 15^2 \neq 16^2$ **9.** Yes; $2.5^2 + 6^2 = 6.5^2$

10. Yes; $6^2 + 8^2 = 10^2$

11. 78 cm **12.** 14.2 in. **13.** 13 **14.** 3.6 cm

15. 8 in.

16. **a.** external

b. external

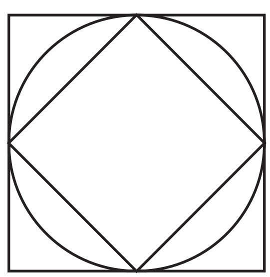
c. internal

d. blue lines; green lines

e. No; explanations may vary.

17. 35.8 km **18.** 80.0 km **19.** 113.1 km **20.** 57.5

21. **a.**

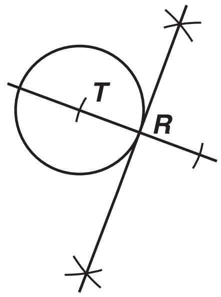


b. Answers may vary. Sample: If you draw diagonals in the small square, 8 ≅ △s are formed in the large square with 4 in the small square.

22. B

23. All four are $\cong$; the two tangents to each coin from A are $\cong$, so by the Trans. Prop., all are $\cong$.

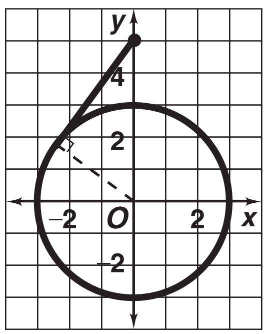
24.



25. 35

26. $90 - \left(\frac{180 - x}{2}\right)$ or $\frac{x}{2}$; $m\angle 4$ is $\frac{1}{2}m\angle 1$.

27.



4 units

28. about 5.2 in.

29. **a.** $\perp$

b. LK

c. SAS

d. CPCTC

e. tangent

f. false

30. **1.** $\overline{BA}$ and $\overline{BC}$ are tangent to $\odot O$ at A and C (Given)

2. $\overline{AB} \perp \overline{OA}$ and $\overline{BC} \perp \overline{OC}$ (If a line is tan. to a circle, it is $\perp$ to the radius.)

3. $\triangle BAO$ and $\triangle BCO$ are right △s. (Def. of rt. $\triangle$)

4. $\overline{AO} \cong \overline{OC}$ (Radii of a circle are $\cong$.)

5. $\overline{BO} \cong \overline{BO}$ (Refl. Prop. of $\cong$)

6. $\triangle BAO \cong \triangle BCO$ (HL Thm.)

7. $\overline{BA} \cong \overline{BC}$ (CPCTC)

31. **1.** $\overline{BC}$ is tangent to $\odot A$ at D. (Given)

2. $\overline{DB} \cong \overline{DC}$ (Given)

3. $\overline{AD} \perp \overline{BC}$ (If a line is tan. to a circle, it is $\perp$ to the radius.)

4. $\triangle ADB$ and $\triangle ADC$ are rt. △s (Def. of rt. $\triangle$)

5. $\overline{AD} \cong \overline{AD}$ (Refl. Prop. of $\cong$)

6. $\triangle ADB \cong ADC$ (SAS)

7. $\overline{AB} \cong \overline{AC}$ (CPCTC)

32. **1.** $\odot A$ and $\odot B$ with common tangents $\overline{DF}$ and $\overline{CE}$ (Given)

2. $GD = GC$ and $GE = GF$ (Two tan. segments from a pt. to a circle are $\cong$.)

3. $\frac{GD}{GC} = 1, \frac{GF}{GE} = 1$ (Div. Prop. of $=$)

4. $\frac{GD}{GC} = \frac{GF}{GE}$ (Trans. Prop. of $=$)

5. $\angle DGC \cong \angle EGF$ (Vert. ∠s are $\cong$.)

6. $\triangle GDC \sim \triangle GFE$ (SAS $\sim$ Thm.)

33. Assume $\overleftrightarrow{AB}$ is not tangent to $\odot O$. Then either $\overleftrightarrow{AB}$ does not intersect $\odot O$ or $\overleftrightarrow{AB}$ intersects $\odot O$ at two pts. If $\overleftrightarrow{AB}$ does not intersect $\odot O$, then P is not on $\odot O$, which contradicts $\overline{OP}$ being a radius. If $\overleftrightarrow{AB}$ intersects $\odot O$ at two pts., P and Q, then $\overline{OP} \cong \overline{OQ}$ ($\cong$ radii), $\triangle OPQ$ is isosc., and $\angle OPQ \cong \angle OQP$. But $\angle OPQ$ is a rt. $\angle$, since $\overline{AB} \perp \overline{OP}$, and $\triangle OPQ$ has two rt. $\angle$s. This is a contradiction also, so $\overleftrightarrow{AB}$ is tangent to $\odot O$.

34. At each vertex, let the radius of a circle be the distance from the vertex to either point of tangency of the inscribed circle.