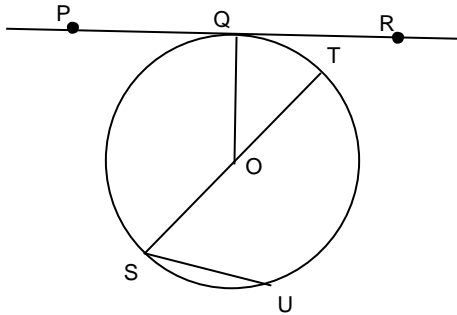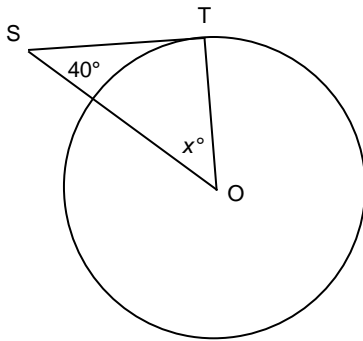## Section 8.1 & 8.2 Review

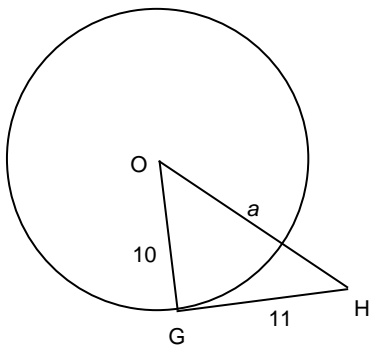**Solve Each Question (SHOW ALL WORK)**

1. O is the centre of this circle.
    Give the name of each line that is a tangent, diameter, radius and chord.
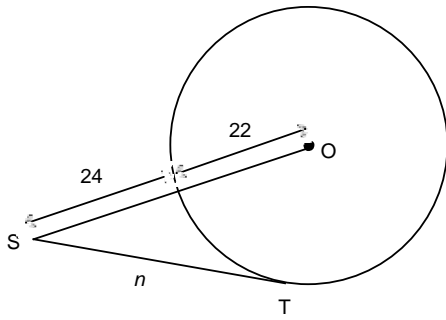

2. O is the centre of this circle and point T is a point of tangency.
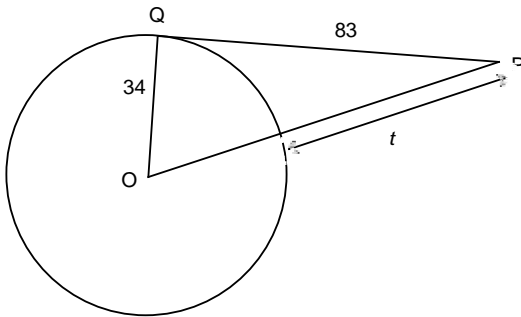   Determine the value of $x°$ and $y°$.

3. O is the centre of this circle and point G is a point of tangency.
    Determine the value of a. If necessary, give your answer to the nearest tenth.

4. O is the centre of this circle and point T is a point of tangency.
    Determine the value of n. If necessary, give your answer to the nearest tenth.

22

24

O

S

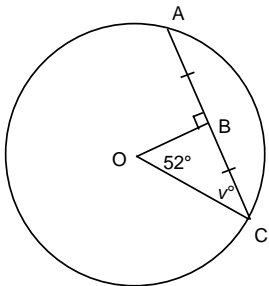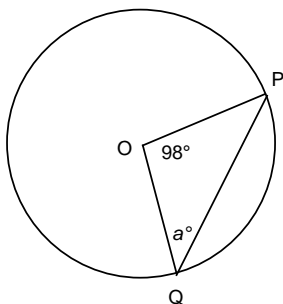n

T

5. O is the centre of this circle and point Q is a point of tangency.
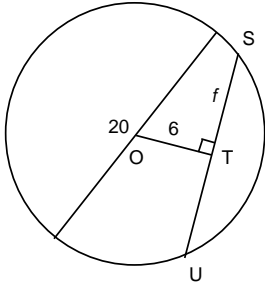   Determine the value of t. If necessary, give your answer to the nearest tenth.

Q

83

34

O

t

6. O is the centre of the circle.
    Determine the value of $v°$.

A

B

O

52°

$v°$

C

7. O is the centre of the circle.
    Determine the value of $a°$.

P

O

98°

$a°$

Q

8.   O is the centre of the circle.
      Determine the value of *f* to the nearest tenth, if necessary.

9. Draw a line through point P that is NOT a tangent to the circle.
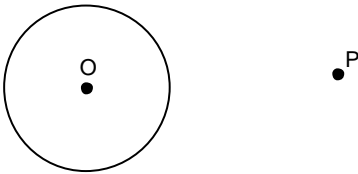
10.   A circular mirror with radius 27 cm hangs from a hook.
      The wire is 46 cm long and is a tangent to the circle at points A and B.
      How far, to the nearest tenth, above the top of the mirror is the hook?
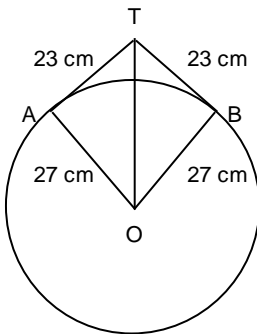
12.   A circle has diameter 32 cm. How far from the centre of the circle, to the nearest centimetre, is a chord 20
                cm long? (Provide a Picture)

Section 8.1 & 8.2 Review
Answer Section

MULTIPLE CHOICE

1. ANS: C   PTS: 1   DIF: Easy
   REF: 8.1 Properties of Tangents to a Circle   LOC: 9.SS1
   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
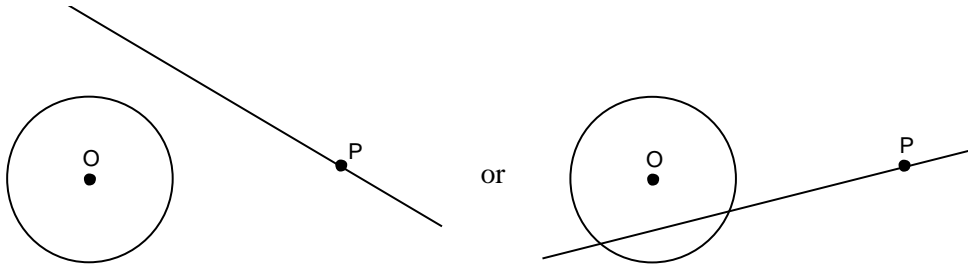2. ANS: B   PTS: 1   DIF: Easy
   REF: 8.1 Properties of Tangents to a Circle   LOC: 9.SS1
   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
3. ANS: D   PTS: 1   DIF: Easy
   REF: 8.1 Properties of Tangents to a Circle   LOC: 9.SS1
   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
4. ANS: B   PTS: 1   DIF: Easy
   REF: 8.1 Properties of Tangents to a Circle   LOC: 9.SS1
   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
5. ANS: D   PTS: 1   DIF: Moderate
   REF: 8.1 Properties of Tangents to a Circle   LOC: 9.SS1
   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
6. ANS: D   PTS: 1   DIF: Moderate
   REF: 8.1 Properties of Tangents to a Circle   LOC: 9.SS1
   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
7. ANS: B   PTS: 1   DIF: Moderate
   REF: 8.1 Properties of Tangents to a Circle   LOC: 9.SS1
   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
8. ANS: D   PTS: 1   DIF: Easy   REF: 8.2 Properties of Chords in a Circle
   LOC: 9.SS1   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
9. ANS: C   PTS: 1   DIF: Easy   REF: 8.2 Properties of Chords in a Circle
   LOC: 9.SS1   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
10. ANS: B   PTS: 1   DIF: Moderate   REF: 8.2 Properties of Chords in a Circle
    LOC: 9.SS1   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding

SHORT ANSWER

11. ANS:
    AC

    PTS: 1   DIF: Easy   REF: 8.1 Properties of Tangents to a Circle
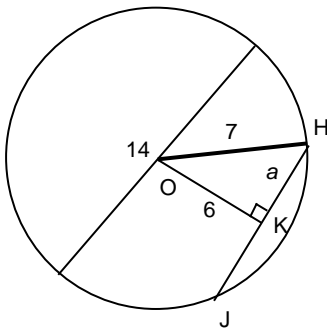   LOC: 9.SS1   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding
12. ANS:
    Answers will vary. For example:

13. ANS:
$v° = 65°$, $w° = 35°$

14. ANS:
$s = 20.6$, $t = 37.2$

15. ANS:
Answers may vary. For example:

PROBLEM

16. ANS:
The distance from the centre of the mirror to the hook is: OT
So, the distance from the top of the mirror to the hook is: OT – 27 cm
Solve for OT.

$OT^2 = 27^2 + 23^2$

$OT^2 = 1258$

$OT = \sqrt{1258}$

$OT \doteq 35.4682...$

So,

OT – 27 cm

= 35.4682... cm – 27 cm

= 8.4682... cm

So, the hook is about 8.5 cm above the mirror.

PTS: 1   DIF: Moderate   REF: 8.1 Properties of Tangents to a Circle
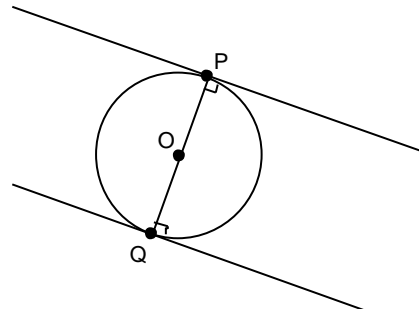LOC: 9.SS1   TOP: Shape and Space (Measurement)   KEY: Problem-Solving Skills

17. ANS:

Two tangent lines are parallel when they intersect a circle at opposite endpoints of a diameter.

For example, in this sketch, the tangent through Q is perpendicular to the diameter PQ, and the tangent through P is also perpendicular to the diameter PQ, so the tangent lines are parallel.

PTS: 1   DIF: Moderate   REF: 8.1 Properties of Tangents to a Circle
LOC: 9.SS1   TOP: Shape and Space (Measurement)
KEY: Conceptual Understanding | Communication

18. ANS:

AC = AB + BC

Use the Pythagorean Theorem in $\triangle OAB$ and $\triangle OBC$:

$AB^2 = OA^2 - OB^2$ and $BC^2 = OC^2 - OB^2$

$AB^2 = 19^2 - 11^2$ $BC^2 = 34^2 - 11^2$

$AB = \sqrt{19^2 - 11^2}$ $BC = \sqrt{34^2 - 11^2}$

$AB \doteq 15.4919...$ $BC \doteq 32.1714...$

So, $AC \doteq 15.4919... + 32.1714...$

$\doteq 47.6633...$

AE = AF + FE

Use the Pythagorean Theorem in $\triangle OAF$ and $\triangle OEF$:

$AF^2 = OA^2 - OF^2$ and $FE^2 = OE^2 - OF^2$

$AF^2 = 19^2 - 11^2$ $FE^2 = 19^2 - 11^2$

$AF = \sqrt{19^2 - 11^2}$ $FE = \sqrt{19^2 - 11^2}$

$AF \doteq 15.4919...$ $FE \doteq 15.4919...$

So, $AE \doteq 15.4919... + 15.4919...$

$\doteq 30.9838...$

$CE = CD + DE$
Use the Pythagorean Theorem in $\triangle OCD$ and $\triangle ODE$:

$CD^2 = OC^2 - OD^2$ and $DE^2 = OE^2 - OD^2$

$CD^2 = 34^2 - 11^2$ $DE^2 = 19^2 - 11^2$

$CD = \sqrt{34^2 - 11^2}$ $DE = \sqrt{19^2 - 11^2}$

$CD \doteq 32.1714...$ $DE \doteq 15.4919...$

So, $CE \doteq 32.1714... + 15.4919...$

$\doteq 47.6633...$

The triangle has side lengths of about 47.7, 47.7, and 31.

PTS: 1 DIF: Moderate REF: 8.1 Properties of Tangents to a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Problem-Solving Skills

19. ANS:
Use the Pythagorean Theorem in $\triangle ABP$ to solve for AP.

$AP^2 = 18^2 - 6^2$

$AP = \sqrt{18^2 - 6^2}$

$AP \doteq 16.9706...$

$\triangle ABP \cong \triangle ACQ$
Consider $\triangle ACQ$ as an enlargement of $\triangle ABP$.
The scale ratio is:

$\dfrac{CQ}{BP} = \dfrac{12}{6}$

$= 2$

So, $AQ = 2(AP)$
Then,

$y = AQ - AP$

$= 2(AP) - AP$

$= AP$

So, $y \doteq 17.0$

PTS: 1 DIF: Difficult REF: 8.1 Properties of Tangents to a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Problem-Solving Skills
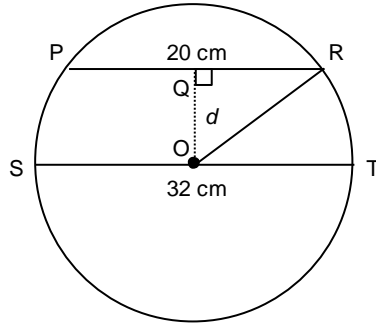
20. ANS:

Sketch a diagram.

Let *d* represent the distance from the chord to the centre of the circle.

Draw a radius from the centre to one end of the chord.

Label the known lengths.

PR is a chord of the circle, and OQ is perpendicular to the chord, passing through the centre of the circle, so PQ = QR and QR is $\frac{1}{2}$ of PR:

$QR = \frac{1}{2}(20 \text{ cm})$

$= 10 \text{ cm}$

ST is a diameter of the circle, and OR is a radius of the circle, so OR is $\frac{1}{2}$ of ST:

$ST = \frac{1}{2}(32 \text{ cm})$

$= 16 \text{ cm}$

Use the Pythagorean Theorem in $\triangle OQR$.
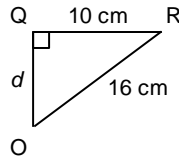
$d^2 + 10^2 = 16^2$

$d^2 = 16^2 - 10^2$

$d^2 = 156$

$d = \sqrt{156}$

$d \doteq 12.4899\ldots$

So, the chord is approximately 12 cm from the centre of the circle.

PTS: 1   DIF: Moderate   REF: 8.2 Properties of Chords in a Circle
LOC: 9.SS1   TOP: Shape and Space (Measurement)   KEY: Conceptual Understanding