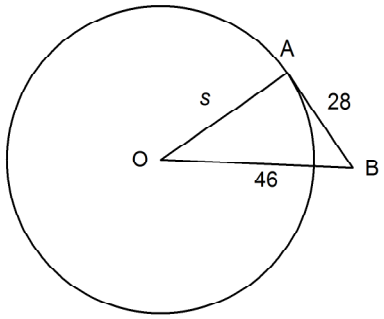
Name: _____ **Class:** _____ **Date:** _____ **ID: A**

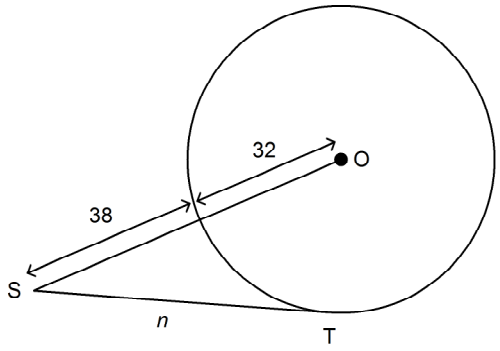
Math 9: Unit 8 Review

Short Answer

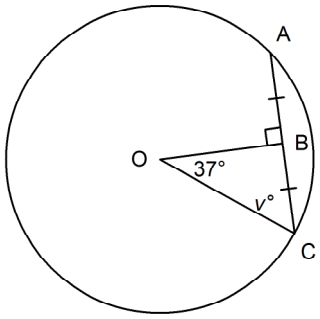
1. O is the centre of this circle and point A is a point of tangency.
   Determine the value of b. If necessary, give your answer to the nearest tenth.



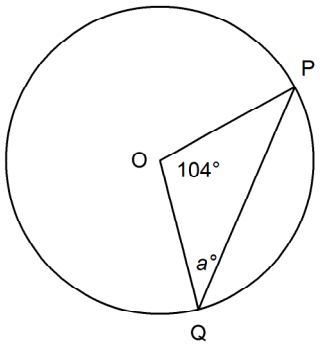
2. O is the centre of this circle and point T is a point of tangency.
   Determine the value of n. If necessary, give your answer to the nearest tenth.



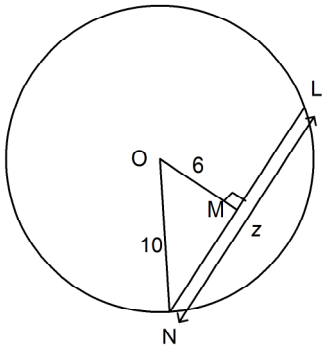
3. O is the centre of the circle.
   Determine the value of $v°$.



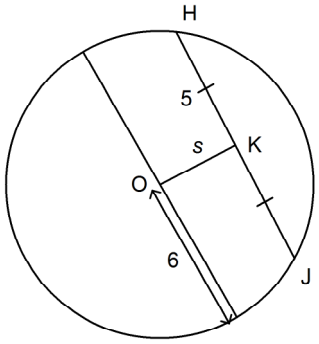
4. O is the centre of the circle.
   Determine the value of $a°$.



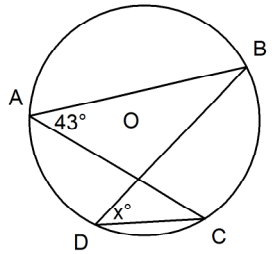
5. O is the centre of the circle.
Determine the value of z to the nearest tenth, if necessary.



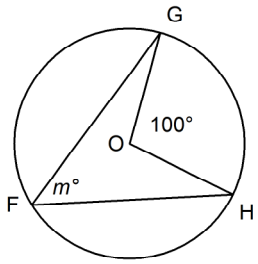
6. O is the centre of the circle.
Determine the value of s to the nearest tenth, if necessary.



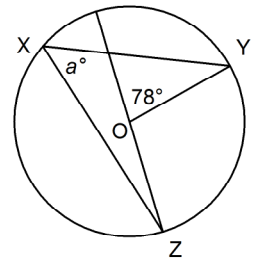
7. O is the centre of this circle.
Determine the value of $x°$.



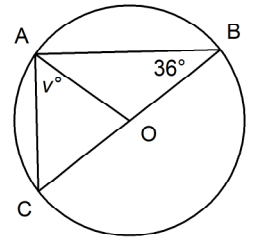
8. O is the centre of this circle.
Determine the value of $m°$.



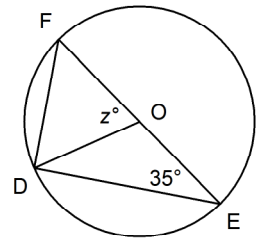
9. O is the centre of this circle.
Determine the value of $a°$.



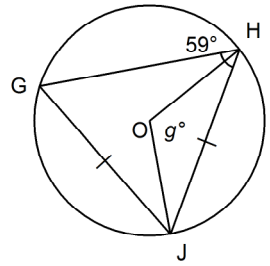
10. O is the centre of this circle.
Determine the value of $v°$.



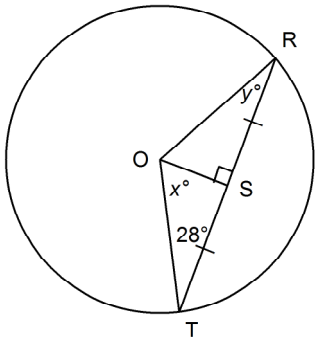
11. O is the centre of this circle.
Determine the value of $z°$.



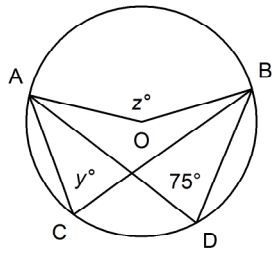
12. O is the centre of this circle.
Determine the value of $g°$.



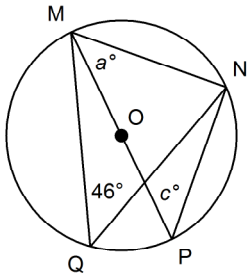
13. Point O is the centre of this circle.
Determine the values of $x°$ and $y°$.



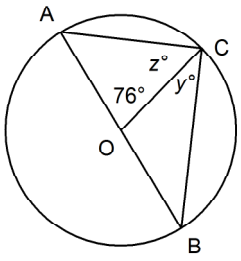
14. Point O is the centre of this circle.
Determine the values of $y°$ and $z°$.



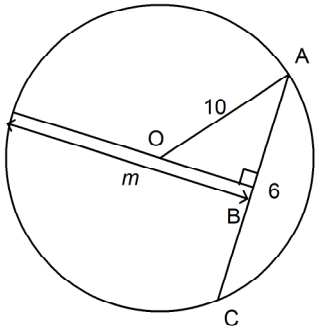
15. Point O is the centre of the circle.
Determine the values of $a°$ and $c°$.



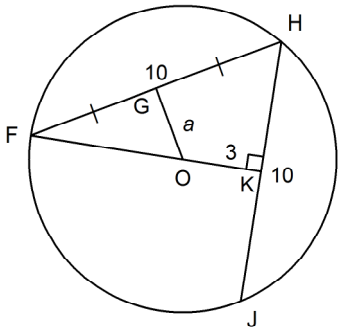
16. Point O is the centre of the circle.
Determine the values of $y°$ and $z°$.



17. Point O is the centre of this circle.
Determine the value of m to the nearest tenth, if necessary.

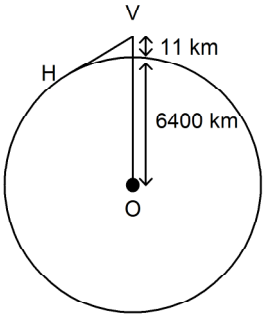


18. Point O is the centre of this circle.
Determine the value of a to the nearest whole number.

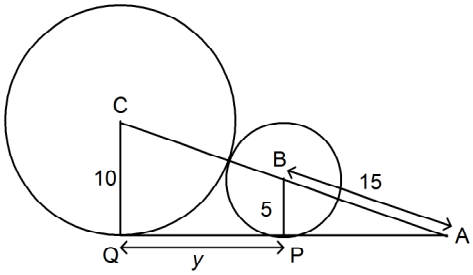


Problem

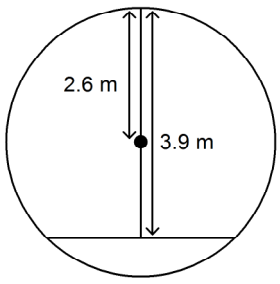
19. A Ruppell's Griffon Vulture holds the record for the bird with the highest documented flight altitude. It was spotted at a height of about 11 km above the Earth's surface. The radius of Earth is approximately 6400 km. How far was the vulture from the horizon, H? Calculate this distance to the nearest kilometre.



20. AQ is a tangent to the circle with centre B and to the circle with centre C.
The points of tangency are P and Q.
Determine the value of y to the nearest tenth.



21. A pedestrian underpass is constructed using a cylindrical pipe of radius 2.6 m. The bottom of the pipe will be filled and paved. The headroom at the centre of the path is 3.9 m.
How wide is the path to the nearest tenth of a metre?



Math 9: Unit 8 Review
Answer Section

SHORT ANSWER

1. ANS:
36.5

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:
62.3

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

3. ANS:
53°

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

4. ANS:
38°

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

5. ANS:
16

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

6. ANS:
3.3

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

7. ANS:
43°

PTS: 1 DIF: Easy REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

8. ANS:
50°

PTS: 1 DIF: Easy REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

9. ANS:
51°

PTS: 1 DIF: Moderate REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

10. ANS:
54°

PTS: 1 DIF: Moderate REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

11. ANS:
70°

PTS: 1 DIF: Moderate REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

12. ANS:
118°

PTS: 1 DIF: Moderate REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

13. ANS:
$x° = 62°$, $y° = 28°$

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

14. ANS:
$y° = 75°$, $z° = 150°$

PTS: 1 DIF: Easy REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

15. ANS:
$a° = 44°$, $c° = 46°$

PTS: 1 DIF: Moderate REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

16. ANS:
$y° = 38°$, $z° = 52°$

PTS: 1 DIF: Moderate REF: 8.3 Properties of Angles in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Conceptual Understanding

17. ANS:
$m = 19.5$

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

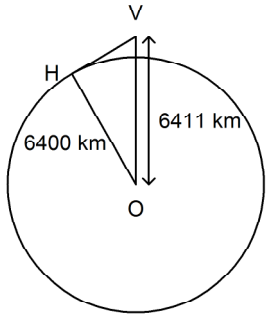
18. ANS:
$a = 3$

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

PROBLEM

19. ANS:
$OV = 11\text{ km} + 6400\text{ km}$

$= 6411\text{ km}$
$OH = 6400\text{ km}$



Use the Pythagorean Theorem in $\triangle OHV$ to solve for HV.
$HV^2 = OV^2 - OH^2$

$HV^2 = 6411^2 - 6400^2$

$HV^2 = 140\,921$

$HV = \sqrt{140\,921}$

$HV \doteq 375.3944\ldots$
The vulture was about 375 kilometres from the horizon.

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

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

$AP^2 = 15^2 - 5^2$

$AP = \sqrt{15^2 - 5^2}$

$AP \doteq 14.1421\ldots$

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

$\frac{CQ}{BP} = \frac{10}{5}$

$= 2$

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

$y = AQ - AP$

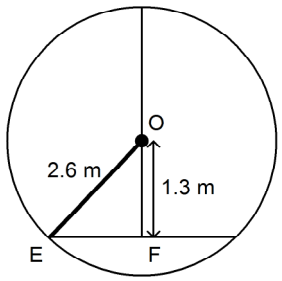
$= 2(AP) - AP$

$= AP$

So, $y \doteq 14.1$

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

21. ANS:



Draw a radius from the centre of the pipe, O, to an edge of the path, E.
Label the midpoint of the path F.
OE is a radius, so: OE = 2.6 m
OF = 3.9 m – 2.6 m

= 1.3 m

Use the Pythagorean Theorem in $\triangle$OEF to solve for EF.

$EF^2 + 1.3^2 = 2.6^2$

$EF^2 = 2.6^2 - 1.3^2$

$EF^2 = 5.07$

$EF = \sqrt{5.07}$

$EF = 2.2516\ldots$

The width of the path is twice the length of EF.
$2(2.2516\ldots) = 4.5033\ldots$
So, the width of the path is about 4.5 m.

PTS: 1 DIF: Difficult REF: 8.2 Properties of Chords in a Circle
LOC: 9.SS1 TOP: Shape and Space (Measurement) KEY: Problem-Solving Skills