Practice Questions for Circles

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| Question | What is the measure of the radius of the circle that circumscribes a triangle whose sides measure 9, 40 and 41? |
| Option A | 6 |
| Option B | 4 |
| Option C | 24.5 |
| Option D | 20.5 |
| Answer | Option D |
| Explanation | from the measure of the length of the sides of the triangle, 9, 40 and 41 we can infer that the triangle is a right angled triangle. 9-40-41 is a Pythagorean triplet.  In a right angled triangle, the radius of the circle that circumscribes the triangle is half the hypotenuse.  In the given triangle, the hypotenuse = 41.  Therefore, the radius of the circle that circumscribes the triangle = 41/2 = 20.5 units. |

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| Question | [image] AB is a diameter of a circle, center O. C is a point on the circumference of the circle, such that ∠CAB = 26°. What is the size of ∠CBA? |
| Option A | 26° |
| Option B | 45° |
| Option C | 64° |
| Option D | 74° |
| Answer | Option C |
| Explanation | Since AB is a diameter of the circle, it divides the circle into two semicircles.  The Angle in the Semicircle Theorem tells us that ∠ACB = 90° Now use angles of a triangle add to 180° to find ∠CBA: ∠CBA + 26° + 90° = 180° ⇒ ∠CBA = 64° |

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| Question | [image] L, M and N are points on the circumference of a circle, center O.  ∠MON = 98°. What is the size of ∠MLN? |
| Option A | 41° |
| Option B | 49° |
| Option C | 51° |
| Option D | 82° |
| Answer | Option B |
| Explanation | The Angle at the Center Theorem tells us that  ∠MON = 2 × ∠MLN  So ∠MLN = ½ × ∠MON = ½ × 98° = 49° |

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| Question | [image] V, W, X and Y are points on the circumference of a circle, center O. Chords VX and WY intersect at the point Z. ∠XVW = 72° and ∠VXY = 38° What is the size of ∠VZW? |
| Option A | 38° |
| Option B | 60° |
| Option C | 70° |
| Option D | 72° |
| Answer | Option C |
| Explanation | ∠VWY and ∠VXY are both subtended by the same arc, VY. The Angles subtended by the Same Arc Theorem tells us that these angles are equal ⇒ ∠VWY = 38° This is the same angle as ∠VWZ = 38° Now use angles of a triangle add to 180° in triangle VWZ ∠VZW + ∠WVZ + ∠VWZ = 180° So ∠VZW + 72° + 38° = 180° ⇒ ∠VZW + 110° = 180° ⇒ ∠VZW = 70° |

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| Question | A, B, C and D are points on the circumference of a circle, center O.  [image] Chords AB and CD intersect at the point X. ∠AXD = 92° and ∠CBA = 57° What is the size of ∠DAX? |
| Option A | 21° |
| Option B | 31° |
| Option C | 41° |
| Option D | 46° |
| Answer | Option B |
| Explanation | ∠CBA and ∠CDA are both subtended by the same arc, AC. The "Angles Subtended by Same Arc Theorem" tells us that these angles are equal ∠CBA = 57°, so ∠CDA = 57° (Which is the same angle as ∠XDA = 57°) Now we know 2 angles in the triangle ADX, we can use angles of a triangle add to 180°: ∠XDA + ∠DXA + ∠DAX = 180° So 57° + 92° + ∠DAX = 180° ⇒  149° + ∠DAX = 180°  ⇒ ∠DAX = 31° |

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| Question | [image] WXYZ is a cyclic quadrilateral drawn inside a circle center O and V is on the line XW extended.  ∠XYZ = 83°  What is the size of ∠VWZ? |
| Option A | 80° |
| Option B | 83° |
| Option C | 87° |
| Option D | 97° |
| Answer | Option B |
| Explanation | Opposite angles of a cyclic quadrilateral are supplementary (add to 180°) So ∠XYZ + ∠XWZ = 180° ⇒  83° + ∠XWZ = 180° ⇒ ∠XWZ = 97° VWX is a straight line So ∠VWZ + ∠XWZ = 180° ⇒ ∠VWZ + 97° = 180° ⇒ ∠VWZ = 83° Note: This shows that ∠XYZ = ∠VWZ.  This result is generally true for any cyclic quadrilateral. |

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| Question | [image] RS and RT are tangents to the circle center O. ∠SRT = 40° What is the size of ∠SUT? |
| Option A | 40° |
| Option B | 50° |
| Option C | 70° |
| Option D | 80° |
| Answer | Option C |
| Explanation | RS is a tangent ⇒ ∠OSR = 90°  RT is a tangent ⇒ ∠OTR = 90°  OSRT is a quadrilateral, so has an angle sum of 360° ⇒ ∠OSR + ∠SRT + ∠OTR + ∠SOT = 360° ⇒ 90° + 40° + 90° + ∠SOT = 360° ⇒ 220° + ∠SOT = 360° ⇒ ∠SOT = 140° Now use the Angle at the Center Theorem ∠SUT = ½ × ∠SOT = ½ × 140° = 70° |

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| Question | [image] RS and RT are tangents to the circle center O. ∠SUT = 72° What is the size of ∠SRT? |
| Option A | 36° |
| Option B | 45° |
| Option C | 54° |
| Option D | 72° |
| Answer | Option A |
| Explanation | First use the Angle at the Center Theorem ∠SOT = 2 × ∠SUT = 2 × 72° = 144° RS is a tangent ⇒ ∠OSR = 90°  RT is a tangent ⇒ ∠OTR = 90°  OSRT is a quadrilateral, so has an angle sum of 360° ⇒ ∠OSR + ∠SRT + ∠OTR + ∠SOT = 360° ⇒ 90° + ∠SRT + 90° + 144° = 360° ⇒ 324° + ∠SRT = 360° ⇒ ∠SRT = 36° |

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| Question | ABCD is a square with one vertex at the center of the circle and two vertices on the circle. What is the length of AC if the area of the circle is 314 square cm?  circles problem 9 |
| Option A | 10 |
| Option B | 20 |
| Option C | 10 |
| Option D | 15 |
| Answer | Option C |
| Explanation | Area of Circle = = 314  As we know π = 3.14  So = 314/3.14 = 100  Or r = 10  So AB = AD = 10  As ABCD is a square so AC = side = 10 |

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| Question | The three circles C1, C2 and C3 have their centers O1, O2 and O3 on the line L and are all tangent at the same point. If the diameter of the largest circle is 20 units, what is the ratio of the area of the largest circle to the area of the smallest circle?  circles problem 1 |
| Option A | 1:16 |
| Option B | 1:8 |
| Option C | 8:1 |
| Option D | 16:1 |
| Answer | Option D |
| Explanation | Diameter of Largest circle = 20 units  Radius of Largest Circle = 10 units  Diameter of Smaller Circle = 10/2 units  Radius of Smaller Circle = 10/4 units  Ratio of area of largest to smallest circle = = 16:1 |

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| Question | **The radical axis of two circles and the line joining their centres are.** |
| Option A | Parallel |
| Option B | Neither Parallel nor perpendicular |
| Option C | Perpendicular |
| Option D | Intersecting but not perpendicular |
| Answer | Option C |
| Explanation | We know that the radical axis of two circles is the locus of a point which moves in such a way that the lengths of the tangents drawn from it to the two circles are equal. It is a line perpendicular to the line joining the centres of two circles. |

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| Question | ***A sector of a circle has a central angle of 80 degrees.If the radius of the sector is 6cm, what is the area of the sector?*** |
| Option A | 8 π |
| Option B | 4 π |
| Option C | 12 π |
| Option D | None of these |
| Answer | Option A |
| Explanation | Area of Circle is  For r = 6, Area = 36π  As we know this area is for 360°  For 80° sector it will be 80/360 X Area  = 2/9 X 36π  = 8 π |

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| Question | In the accompanying diagram, tangent http://www.regentsprep.org/Regents/math/geometry/MultipleChoiceReviewG/Circle26.gif and secant http://www.regentsprep.org/Regents/math/geometry/MultipleChoiceReviewG/Circle27.gif are drawn to circle O from point A, AB = 6 and  AC = 4.  Find AD.  http://www.regentsprep.org/Regents/math/geometry/MultipleChoiceReviewG/Circle23.gif |
| Option A | 4 |
| Option B | 6 |
| Option C | 9 |
| Option D | 12 |
| Answer | Option C |
| Explanation | We know  So  Or 36 = 4 X AD  Or AD = 9 |
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| Question | The number of common tangents that can be drawn for two externally tangent circles is |
| Option A | 1 |
| Option B | 2 |
| Option C | 3 |
| Option D | 4 |
| Answer | Option C |
| Explanation | 3 tangents can be drawn as  C:\Users\vyasmv.KECRPG.001\Downloads\maxresdefault.jpg |

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| Question | Given the circle at the right with designated center, designated perpendicular, and radius 5.  Find the length of the segment labeled *x.*   |  | | --- | | http://www.regentsprep.org/Regents/math/geometry/MultipleChoiceReviewG/Circle2.gif | |  | | |
| Option A | 6 |
| Option B | 5 |
| Option C | 4 |
| Option D | 3 |
| Answer | Option C |
| Explanation | In the given diagram, x will be base of a right angle triangle with sides, 3 and 5  As we know (By Pythagoras Theorem)  Or x = 4 |