4959626859 84148446624 13816375.627451 17656145.20339 17745116.509804 28661811.690141 3322461198 136421811120 3544096.359375 87887303328 15857824.126316 7813710.9672131 45483538675

Properties of tangents answers answer sheets pdf

$\therefore$ Slope of the tangent, $m = \dfrac{-2\cos\theta}{3\sin\theta}$ **(1)**

$$\left\{\because m = \left[\frac{dy}{dx}\right]_{(x_1,\, y_1)}\right\}$$

Now, equation of tangent at the point $(3\cos\theta, 2\sin\theta)$ having slope

$$m = -\frac{2\cos\theta}{3\sin\theta} \text{ is}$$

$$y - y_1 = m(x - x_1)$$

$$\Rightarrow \quad y - 2\sin\theta = \frac{-2\cos\theta}{3\sin\theta}(x - 3\cos\theta) \quad \textbf{(1)}$$

$$\Rightarrow \quad 3y\sin\theta - 6\sin^2\theta = -2x\cos\theta + 6\cos^2\theta$$

$$\Rightarrow \quad 2x\cos\theta + 3y\sin\theta - 6(\sin^2\theta + \cos^2\theta) = 0$$

$$\Rightarrow 2x\cos\theta + 3y\sin\theta - 6 = 0$$

$$[\because \sin^2\theta + \cos^2\theta = 1]$$

which is the required equation of tangent. **(1)**

Given equation of curve is

$$y = x^3 + 2x + 6 \qquad \ldots(i)$$

and the given equation of line is

$$x + 14y + 4 = 0$$

On differentiating both sides of Eq. (i) w.r.t. x, we get

$$\frac{dy}{dx} = 3x^2 + 2$$

$$\therefore \text{ Slope of normal} = \frac{-1}{\left(\frac{dy}{dx}\right)} = \frac{-1}{3x^2 + 2}$$

Also, slope of the line $x + 14y + 4 = 0$ is $-\dfrac{1}{14}$. **(1)**

$$\left[\because \text{slope of the line } Ax + By + C = 0 \text{ is} -\frac{A}{B}.\right]$$

[$\because$ we know that, if two lines are parallel, then their slopes are equal]

$$\therefore \quad 3x^2 + 2 = 14$$

$$\Rightarrow \quad 3x^2 = 12 \Rightarrow x^2 = 4$$

$$\Rightarrow \quad x = \pm 2 \quad \textbf{(1)}$$

From Eq. (i), when $x = 2$, then

$$y = (2)^3 + 2(2) + 6$$

$$= 8 + 4 + 6 = 18$$

and when $x = -2$, then

$$y = (-2)^3 + 2(-2) + 6$$

$$= -8 - 4 + 6 = -6$$

$\therefore$ Normal passes through (2, 18) and (–2, –6).

Also, slope of normal $= \dfrac{-1}{14}$.

Hence, equation of normal at point (2, 18) is

$$y - 18 = \frac{-1}{14}(x - 2)$$

$$\Rightarrow \quad 14y - 252 = -x + 2$$

$$\Rightarrow \quad x + 14y = 254 \quad \textbf{(1)}$$

and equation of normal at point (–2, –6) is

$$y + 6 = -\frac{1}{14}(x + 2)$$

$$\Rightarrow \quad 14y + 84 = -x - 2$$

$$\Rightarrow \quad x + 14y = -86 \quad \textbf{(1)}$$

Hence, the two equations of normal are $x + 14y = 254$ and $x + 14y = -86$.

The following questions are to be solved using the tangent ratio only.

1. ABC is a right-angled triangle with the angle at A = 90°. What is the length of the side AB, with the following values for the side AC and the angle at C ?(all distances in cm, answers to 2 d.p.)

(a) 8, 30° (b) 14, 45° (c) 28, 60°

(d) 15, 51° (e) 17, 39° (f) 21, 66°

(g) 10, 27° (h) 28, 71° (i) 39, 59°

2. ABC is a right-angled triangle with the angle at B = 90°. What is the length of the side BC, with the following values for the side AB and the angle at C ?(all distances in cm, answers to 2 d.p.)

(a) 6, 59° (b) 27, 21° (c) 37, 27°

(d) 48, 34° (e) 11, 46° (f) 22, 32°

(g) 19, 66° (h) 23, 71° (i) 14, 27°

3. Using the values for the two sides at right angles to each other in a right angled triangle, calculate the unknown interior angles. (all distances in cm, answers to 1 d.p.)

(a) 9, 5 (b) 12, 8 (c) 23, 16

(d) 26, 19 (e) 42, 19 (f) 37, 20

(g) 29, 10 (h) 32, 21 (i) 49, 9

$$= 2\left\{\sin\left(\pi - \frac{\pi}{4}\right)\right\}^2 + 2\left(\frac{1}{\sqrt{2}}\right)^2 + 2(2)^2$$

$$= 2\left\{\sin\frac{\pi}{4}\right\}^2 + 2\times\frac{1}{2} + 8$$

$$= 2\left(\frac{1}{\sqrt{2}}\right)^2 + 1 + 8$$

$$= 1 + 1 + 8 = 10 = \text{R.H.S}$$

Q5: Find the value of (i) sin 75° (ii) tan 15°

Ans: (i) sin 75° = sin (45° + 30°)

We know that

$\sin(x + y) = \sin x \cos y + \cos x \sin y$

$\sin(45° + 30°) = \sin 45° \cos 30° + \cos 45° \sin 30°$

$$= \left(\frac{1}{\sqrt{2}}\right)\left(\frac{\sqrt{3}}{2}\right) + \left(\frac{1}{\sqrt{2}}\right)\left(\frac{1}{2}\right)$$

$$= \frac{\sqrt{3}}{2\sqrt{2}} + \frac{1}{2\sqrt{2}} = \frac{\sqrt{3}+1}{2\sqrt{2}}$$

(ii) tan 15° = tan (45° – 30°)

$$= \frac{\tan 45° - \tan 30°}{1 + \tan 45° \tan 30°} \qquad \left[\tan(x - y) = \frac{\tan x - \tan y}{1 + \tan x \tan y}\right]$$

$$= \frac{1 - \frac{1}{\sqrt{3}}}{1 + 1\left(\frac{1}{\sqrt{3}}\right)} = \frac{\sqrt{3} - 1}{\sqrt{3} + 1} = \frac{\left(\sqrt{3} - 1\right)^2}{\left(\sqrt{3} + 1\right)\left(\sqrt{3} - 1\right)}$$

$$= 2 - \sqrt{3}$$

Q6: Prove that:

$$\cos\left(\frac{\pi}{4} - x\right)\cos\left(\frac{\pi}{4} - y\right) - \sin\left(\frac{\pi}{4} - x\right)\sin\left(\frac{\pi}{4} - y\right) = \sin(x + y)$$

Ans: LHS $= \cos\left(\frac{\pi}{4} - x\right)\cos\left(\frac{\pi}{4} - y\right) - \sin\left(\frac{\pi}{4} - x\right)\sin\left(\frac{\pi}{4} - y\right)$

Let $\left(\frac{\pi}{4} - x\right) = A$ and $\left(\frac{\pi}{4} - y\right) = B$

Therefore, LHS = cosA cosB – sinA sinB

$$= \cos(A + B)$$

$$= \cos\left(\frac{\pi}{4} - x + \frac{\pi}{4} - y\right)$$

$$= \cos\left(\frac{\pi}{4} + \frac{\pi}{4} - (x + y)\right)$$

$$= \cos\left(\frac{\pi}{2} - (x + y)\right)$$

$$= \sin(x + y)$$

$$= \text{RHS}$$

Q7: Prove that: $\dfrac{\tan\left(\frac{\pi}{4} + x\right)}{\tan\left(\frac{\pi}{4} - x\right)} = \left(\dfrac{1 + \tan x}{1 - \tan x}\right)^2$

Ans: We know that

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B} \text{ and } \tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

$$\text{Now LHS} = \frac{\tan\left(\frac{\pi}{4} + x\right)}{\tan\left(\frac{\pi}{4} - x\right)} = \frac{\left(\dfrac{\tan\frac{\pi}{4} + \tan x}{1 - \tan\frac{\pi}{4}\tan x}\right)}{\left(\dfrac{\tan\frac{\pi}{4} - \tan x}{1 + \tan\frac{\pi}{4}\tan x}\right)}$$

$$= \frac{\left(\dfrac{1 + \tan x}{1 - \tan x}\right)}{\left(\dfrac{1 - \tan x}{1 + \tan x}\right)} = \left(\frac{1 + \tan x}{1 - \tan x}\right)^2 = \text{RHS}$$

Q8: Prove that: $\dfrac{\cos(\pi + x)\cos(-x)}{\sin(\pi - x)\cos\left(\frac{\pi}{2} + x\right)} = \cot^2 x$

Ans: LHS $= \dfrac{\cos(\pi + x)\cos(-x)}{\sin(\pi - x)\cos\left(\frac{\pi}{2} + x\right)} = \dfrac{[-\cos x][\cos x]}{(\sin x)(-\sin x)}$

$$= \frac{-\cos^2 x}{-\sin^2 x} = \cot^2 x = \text{RHS}$$

Q9: Prove that:

$$\cos\left(\frac{3\pi}{2} + x\right)\cos(2\pi + x)\left[\cot\left(\frac{3\pi}{2} - x\right) + \cot(2\pi + x)\right] = 1$$

Ans: LHS =

$$\cos\left(\frac{3\pi}{2} + x\right)\cos(2\pi + x)\left[\cot\left(\frac{3\pi}{2} - x\right) + \cot(2\pi + x)\right]$$

$$= \sin x \cos x\left[\tan x + \cot x\right]$$

$$= \sin x \cos x\left(\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x}\right)$$

$$= (\sin x \cos x)\left[\frac{\sin^2 x + \cos^2 x}{\sin x \cos x}\right] = 1 = \text{RHS}$$

Q10: Prove that:

$\sin(n + 1)x \sin(n + 2)x + \cos(n + 1)x \cos(n + 2)x = \cos x$

Ans: LHS $= \sin(n + 1)x.\sin(n + 2)x + \cos(n + 1)x.\cos(n + 2)x$

Applying $\cos(C - D) = \cos C.\cos D + \sin C.\sin D$

LHS $= \cos\{(n+1)x - (n+2)x\}$

$= \cos(-x) = \cos x = \text{RHS}$

Q11: Prove that: $\cos\left(\frac{3\pi}{4} + x\right) - \cos\left(\frac{3\pi}{4} - x\right) = -\sqrt{2}\sin x$

Ans: We know: $\cos(A + B) - \cos(A - B) = -2\sin A.\sin B$

Therefore,

LHS $= \cos\left(\frac{3\pi}{4} + x\right) - \cos\left(\frac{3\pi}{4} - x\right)$

$$= -2\sin\left(\frac{3\pi}{4}\right)\sin x = -2\sin\left(\pi - \frac{\pi}{4}\right)\sin x$$

$$= -2\sin\frac{\pi}{4}\sin x = -2\times\frac{1}{\sqrt{2}}\times\sin x$$

$$= -\sqrt{2}\sin x = \text{RHS}$$

3. *If the tangent at any point P on the curve $x^m y^n = a^{m+n} (mn \neq 0)$ meets the coordinate axes in A, B, then show that AB : BP is a constant.*

Solution :

The equation of the curve is

$$x^m y^n = a^{m+n}$$

Differentiating on both sides with respect to 'x'

$$x^m n.\, y^{n-1}.\frac{dy}{dx} + y^n.m.x^{m-1} = 0$$

$$n.x^m.\, y^{n-1}.\frac{dy}{dx} = -m.\, y^n.x^{m-1}$$

$$nx^m.\frac{y^n}{y}.\,\frac{dy}{dx} = -m.y^n.\frac{x^m}{x}$$

$$\frac{n}{y}.\frac{dy}{dx} = \frac{-m}{x} \Rightarrow \frac{dy}{dx} = \frac{-my}{nx}$$

Slope of the tangent at $P(x_1, y_1)$ is

$$m = \left(\frac{dy}{dx}\right)_p = \frac{-my_1}{nx_1}$$

$\therefore$ The equation of the tangent at P is

$$y - y_1 = m\,(x - x_1)$$

$$y - y_1 = \frac{-my_1}{nx_1}\,(x - x_1)$$

$$nx_1 y - nx_1 y_1 = -mxy_1 - mx_1 y_1$$

$$nx_1 y + mxy_1 = mx_1 y_1 + nx_1 y_1$$

$$mxy_1 + nx_1 y = (m+n)x_1 y_1$$

$$\frac{mxy_1}{(m+n)x_1 y_1} + \frac{nx_1 y}{(m+n)x_1 y_1} = 1$$

$$\frac{x}{\frac{(m+n)x_1}{m}} + \frac{y}{\frac{(m+n)y_1}{n}} = 1$$

The tangent meets the coordinate axes at A and B

$$x\text{-intercept } OA = \frac{(m+n)x_1}{m}$$

$$y\text{-intercept } OB = \frac{(m+n)y_1}{n}$$

centres X and Y touch externally at T. Solution: Radius OM ⊥ tangent XY. WX and YZ Here we will solve different types of problems on common tangents to two circles. 1.There are two circles touch each other externally. 3. If a line XY touches a circle at P and MN is a chord of the circle then prove that ∠MPN > ∠MQN, where Q is any point on XY other than P. A tangent is perpendicular to the radius drawn through the point of contact. XY is a chord of the outer circle and a tangent to the inner circle at M. By statements 2 and 3. A tangent that passes through the three vertices of a triangle is known as the circumcircle of the triangle. To prove: ∠MPN > ∠MQN.Proof: Statement Reason 1. Prove that AB subtends a right angle at the centre. I. Prove that ∠XMY = 2∠OXY. XP is a secant and PT is a tangent to a circle. In the figure, WX is a transverse common tangent as the circle with centre O lies below it and the circle with P lie above it. We will discuss circumcentre and incentre of a triangle. So The solved examples on the basic properties of tangents will help us to understand how to solve different type problems on properties of triangle. Prove that A is equidistant from the extremities of the chord. MQ will cut the circle at a point R. If ∠CAY : ∠CAX = 2 : 1 and AD bisects the angle CAX while AB bisects ∠CAY then find the measure of the angles of the cyclic quadrilateral. 5. ∠DAB = ∠ABC 3. Solution: OX = OY, are radii of a circle are equal. XY is a chord such that ∠XYQ = 65°. Then XP = 9x. ∠OXM + ∠XMY + ∠OYM + ∠XOY = 360°⟹ 90° + ∠XMY + 90° + ∠XOY = 360°⟹ ∠XMY + ∠XOY = 360° – 180°⟹ ∠XOY + ∠XMY = 360° – 180° 3. CA ∥ EB. Solution:Given: MN is a chord of a circle and tyhe tangent at the point P is the line XY. We will prove that, in the figure ABCD is a cyclic quadrilateral and the tangent to the circle at A is the line XY. The circle that lies inside a triangle and touches all the three sides of the triangle is known as the incircle of the triangle. As in 1. The two transverse common tangents drawn to two circles are equal in length. Exterior angle is greater than interior opposite angle in a triangle. ∠DAB = ∠ACB 2. The tangents at P, Q and R form the triangle P'Q'R'. notes, 2 wksts)*angles: central, inscribed, vertex inside, vertex outside (2 pgs. Here we will solve different types of Problems on relation between tangent and secant. So, XY = 2MY. A tangent, PQ, to a circle touches it at Y. A straight line is drawn through T to cut the circles at M and N. ∠MRN > ∠RQN 3. ∠OYM = 90° 2. The two direct common tangents drawn to two circles are equal in length. If you're seeing this message, it means we're having trouble loading external resources on our website. Solution: Given: CA, AB and EB are tangents to a circle with centre O. Share this page: What's this? 2. If MX and MY are tangents to the circle at X and Y respectively, prove that ∠XOY and ∠XMY are supplementary angles. The questions include the full unit circle, right triangle trig relationships, the graphs and characteristics of the basic functions (including sine, cosine, and tangent), simplifying rational expressions, multiplying binomials, finding the difference quotient, evaluating functions (including piecewise and inverse), using point-slope form to find an equation of a line, solving equations (includingPage 3These circle notes and worksheets include:parts of a circlecircle anglescircle lines and segmentsarc length and sector area I separate these notes into two packets for my students:Packet 1: *all circles are similar (1 pg. Use this Google Search to find what you need. Given: XY is a chord of a circle and Here we will solve different types of Problems on properties of tangents. Radius of the first circle with centre O is 8 cm. ∠OXY = 90° - ∠MXY A common tangent is called a transverse common tangent if the circles lie on opposite sides of it. In ΔOMY, MY^2 = OY^2 – OM^2 = 5^2 cm^2 – 4^2 cm^2 = 25 cm^2 – 16 cm^2 = 9 cm^2.Therefore, MY = 3 cm. Here, PQ is the required locus. STOP SPENDING YOUR EVENINGS AND WEEKENDS MAKING NOTES! One of the most draining and tiresome parts of a teachers job is the amount of (unpaid) time spent outside the classroom preparing for the next day, week, and month. Also, prove that DB We will prove that, A tangent, DE, to a circle at A is parallel to a chord BC of the circle. notes)*parts of a circle (center, radius, chord, diameter, secant, tangent, point of tangency, arc, sector) (1 pg. In general, the incentre and the circumcentre of a triangle are two distinct points. Prove that P'Q'R' is also an equilateral triangle. Thus, XY = 6 cm.2. In the given figure, OX and OY are two radii of the circle. To prove: ∠AOB = 90°. ∠OXM = 90° 1. When the vertices of a triangle lie on a circle, the sides of the triangle We will discuss here some Examples of Loci Based on Circles Touching Straight Lines or Other Circles. The locus of the centres of circles touching a given line XY at a point M, is the straight line perpendicular to XY at M. notes, 5 wksts)Packet 2:*tangent properties (tangent and radius are perpendicularPage 4TRAPEZOIDS: Properties (Geometry Curriculum in 5 min tasks - Unit 17) Identifying and applying appropriate property, based on the given elements of a trapezoid. Angles in the same segment are equal. Find the length of XY. A special case: an equilateral triangle, the bisector We will discuss here the Incircle of a triangle and the incentre of the triangle. 1. Solution: Proof: Statement 1. Track students' progress consistently, efficiently and frequently with Daily Geometry Checkpoints / HS Geometry curriculum. In ΔMXY, MX = MY. The figures given below shows common tangents in three different cases, that is when the circles are apart, as in (i); when they are touching each other as in (ii); and when Here we will prove that if a chord and a tangent intersect externally then the product of the lengths of the segments of the chord is equal to the square of the length of the tangent from the point of contact to the point of intersection. Given: WX and YZ are two transverse common tangents drawn to the two given circles with centres O and P. ∠MPN > ∠RQN = ∠MQN. Q is any other point on XY. ∠MXY = ∠MYX = x°. Solution:Given: OX and OY are radii and MX and MY are tangents.To prove: ∠XOY + ∠XMY = 180°.Proof: Statement Reason 1. Therefore, OM bisects XY, as ⊥ from centre bisects a chord. Solution: Given: Two circles with centres X and Y touch externally at T. If PT = 15 cm and XY = 8YP, find XP. Given: A circle with centre O. The point of intersection of the direct common tangents and the centres of the circles are collinear. ∠XMY = 180° - x°. XY is tangent at P and so all points of XY except P are outside the circle. YZ is the other transverse common tangent as the Important Properties of Direct common tangents. OM = 4 cm and ON = 5 cm.

Tefl module 7 quiz answers 2, and let o be the symmetric bilinear form on V given by 9(5,9) = ["f(0)g(t)dA:See Answer. answer key keywords: Introduce yourself and answer basic questions about yourself. Courses Foundation 135 60 Hour Course. Assignment due 7/21 by 8:30am. commoncore. 3 Organise seating arrangements; 4. The 170-Hour online TEFL ... Free learn to algebra math, permutations worksheets with answer key, Prentice Hall Mathematics Workbook Answers, 9th grade algebra worksheets, glencoe answerkeys. Solving for 3 variables, do sats papers online, Multiplication of who and mix numbers calculator, how to solve probability questions in graphing calculator, matlab nonlinear equations ... This chapter will cover circle definition, terminologies, how to draw a circle, formulas for circumference and area, properties of circles, circle area proof, etc. Chapter 11 - Construction. This chapter will include constructing a line segment's division, constructing triangles by using scale factor, constructing tangents to a circle. A comprehensive and coherent set of mathematics standards for each and every student from prekindergarten through grade 12, Principles and Standards is the first set of rigorous, college and career readiness standards for the 21st century. Principles and Standards for School Mathematics outlines the essential components of a high-quality school mathematics program. email protected] Show work. S. Either open the file and print or download and save an electronic copy and Amplitude and Period of Trigonometric Functions (2 Enter the email address you signed up with and we'll email you a reset link. May 17, 2022 · Lab 19 wave properties answer key - grupaprymus. Lesson 3 Skill Practice Answer Key. 8 ft 8 ft 32 ft 8 ft 8 ft 8 ft 8 ft Lesson 3 Skills Practice Area of Composite Specify when you would like to receive the paper from your writer. Get homework answers from experts in math, physics, programming, chemistry, economics, biology and more. Enter the email address you signed up with and we'll email you a reset link. It answers some questions about human evolution, linking genetic research to evolution and nutrition. Lesson 12 NPR News report: Challenging the assumption that life evolved in the ocean and then moved to land when the ozone layer formed, protecting land from UV radiation.

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