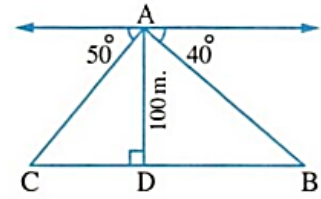


Trigonometry 2nd Sec.

Final revision

In the opposite figure, $\overline{AD}$ represents a light house of height 100 metre from the ground surface, a person from its top observed measure of depression angles of two boats «B, C» in the same horizontal plane passing through the light house base and in two opposite sides from it to be 40° and 50° respectively, then distance between the two boats (BC) $\simeq$ m.



(a) 314

(b) 152

(c) 203

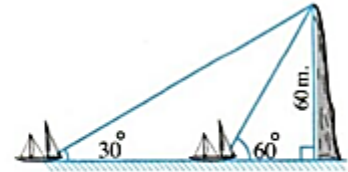
(d) 232

(6) In the opposite figure :

The distance between
the two ships = m.

(a) 60
(c) $\frac{60}{\sqrt{3}}$

(b) $40\sqrt{3}$
(d) $60\sqrt{3}$



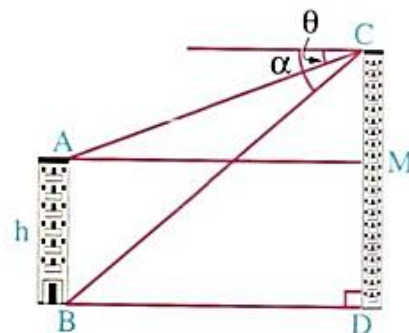
A ship sailed from a certain point in the direction of 12° South of the East with velocity 11 km./h. At the same moment another ship sailed from the same point in the direction of 68° North of the East with velocity 6.5 km./h. , then the distance between the two ships after 2 hours from the time of their sailing together $\simeq$ km.

- (a) 24 (b) 26 (c) 28 (d) 30

In the opposite figure :

$\overline{CD}$ represents a tower , $\overline{AB}$ represents a house of height h metre and θ , α are the measures of the depression angles of A and B from C respectively , then the distance between the top of the tower and the top of the house = m.

- (a) $\frac{h \sin \alpha}{\sin \theta}$ (b) $h \sin \alpha \cos \theta$
 (c) $\frac{h \cos \theta}{\sin (\alpha - \theta)}$ (d) $\frac{h \cos \alpha}{\sin (\alpha - \theta)}$



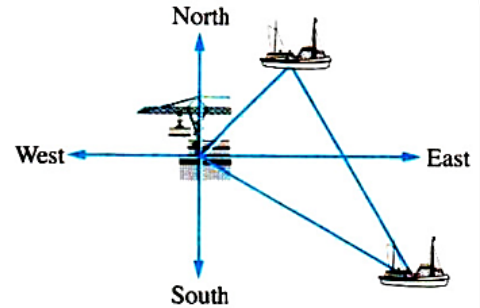
From a balcony of a house 20 m. high , a man observed that the top and the base of a tower in front of him have elevation angle and depression angle each of measure $= \theta$, giving that the house and the tower are on the same horizontal plane , then the height of the tower = m.

- (a) $20 \tan \theta$ (b) $\frac{20}{\tan \theta}$ (c) $40 \csc \theta$ (d) 40

In the opposite figure :

Two ships sailed from the same port and after 2 hours one of them became at a distance 13 km. in the direction north of the east of the port and the other became at a distance 22 km. in direction 30° south of the East of the port. , then at this instant the distance between the two ships $\approx$ km.

- (a) 26 (b) 24 (c) 22 (d) 505



If $\sin A = \frac{-3}{5}$, then $\cos 2A = \dots\dots\dots$

(a) $\frac{16}{25}$

(b) $\frac{-16}{25}$

(c) $\frac{7}{25}$

(d) $\frac{-7}{25}$

If $\cos^4 X - \sin^4 X = \cos k X$, then $k = \dots\dots\dots$

(a) 4

(b) 83

(c) 6

(d) 2

$$\cos 5 X \cos 3 X + \sin 5 X \sin 3 X = \dots\dots\dots$$

(a) $\cos 2 X$

(b) $\cos 8 X$

(c) $\sin 8 X$

(d) $\sin 2 X$

In $\triangle ABC$: $\sin \frac{A+B}{2} \cos \frac{C}{2} + \cos \frac{A+B}{2} \sin \frac{C}{2} = \dots\dots\dots$

(a) $\frac{\sqrt{3}}{2}$

(b) $\frac{1}{2}$

(c) 1

(d) zero

If $\sin A + \cos A = \frac{7}{5}$ where A acute angle , then $\cos 2 A = \dots\dots\dots$

(a) $\frac{24}{25}$

(b) $\pm \frac{24}{25}$

(c) $\frac{7}{25}$

(d) $\pm \frac{7}{25}$

$$\frac{1 + \cos 2X}{\sin 2X} = \dots\dots\dots$$

(a) $\tan X$

(b) $\cos X$

(c) $\sin X$

(d) $\cot X$

$$\frac{\tan 83^\circ - \tan 38^\circ}{1 + \tan 83^\circ \tan 38^\circ} = \dots\dots\dots$$

(a) $\tan 45^\circ$

(b) $\tan 121^\circ$

(c) $\tan 22.5^\circ$

(d) $\tan 60.5^\circ$

In ΔABC if $\tan A = 3$, $\tan B = 5$, then $\tan C = \dots\dots\dots$

(a) $\frac{-1}{7}$

(b) $\frac{1}{7}$

(c) $\frac{-4}{7}$

(d) $\frac{4}{7}$

The area of the equilateral triangle whose side length equals x cm. equals cm^2 .

- (a) x^2 (b) $\frac{\sqrt{3}}{2} x^2$ (c) $\frac{\sqrt{3}}{4} x^2$ (d) $\frac{1}{2} x^2$

In the opposite figure :

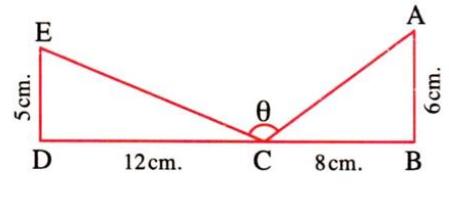
$\sin \theta = \dots\dots\dots$

(a) $\frac{56}{65}$

(b) $\frac{16}{65}$

(c) $\frac{64}{65}$

(d) $\frac{13}{12}$



$$\cos^2 C - \cos 2 C = \dots\dots\dots$$

(a) $\sin C$

(b) $\cos C$

(c) $\sin^2 C$

(d) $\tan C$

If $\cot \frac{A}{2} - \tan \frac{A}{2} = 4$, then $\tan A = \dots\dots\dots$

(a) $\frac{3}{4}$

(b) $\frac{1}{3}$

(c) $\frac{1}{2}$

(d) $\frac{3}{5}$

In the opposite figure :

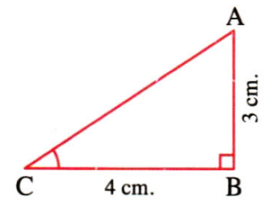
The sum of the lengths of the two radii of the inscribed circle and circumcircle of the ΔABC equals cm.

(a) 4

(b) 3

(c) 5

(d) 3.5



If $\sin X - \cos y = \frac{1}{6}$, $\cos X + \sin y = \frac{5}{6}$, then $\sin (X - y) = \dots\dots\dots$

(a) $\frac{23}{36}$

(b) $\frac{19}{24}$

(c) $\frac{17}{23}$

(d) $\frac{25}{48}$

If $\sin X + \cos X = \frac{\sqrt{2}}{3}$, then $\sin 2X = \dots\dots\dots$

(a) $\frac{-1}{3}$

(b) $\frac{2}{3}$

(c) $\frac{-7}{9}$

(d) $\frac{\sqrt{3}}{2}$

If $\tan (\theta + 45^\circ) = \frac{3}{2}$, then $\tan \theta = \dots\dots\dots$

(a) $\frac{1}{5}$

(b) $\frac{3}{5}$

(c) $\frac{9}{4}$

(d) $\frac{2}{3}$

In the opposite figure :

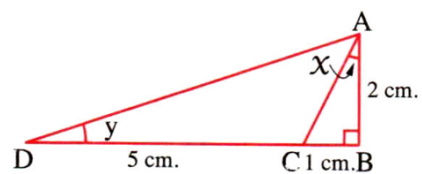
ABD is right angled triangle
at B , then $x + y = \dots\dots\dots^\circ$

(a) 30

(b) 45

(c) 60

(d) 90



If $\sin X \cos X = \frac{12}{25}$, then $\cos 2X = \dots\dots\dots$

(a) $\frac{24}{25}$

(b) $\pm \frac{24}{25}$

(c) $\frac{7}{25}$

(d) $\pm \frac{7}{25}$

$$\frac{1 - \tan^2 X}{1 + \tan^2 X} = \dots\dots\dots$$

(a) $\cos 2 X$

(b) $\sin 2 X$

(c) $\cos X$

(d) $\sin X$

If $\sin^2 2X + 4 \sin X \cos X + 1 = 0$, $\frac{\pi}{2} < X < \pi$, then $X = \dots\dots\dots$

(a) $\frac{7\pi}{12}$

(b) $\frac{2\pi}{3}$

(c) $\frac{3\pi}{4}$

(d) $\frac{5\pi}{6}$

If P is half the perimeter of the triangle ABC , $P + a = 35$ cm., $P + b = 34$ cm., $c = 15$ cm., then the area of triangle $ABC = \dots\dots\dots \text{cm}^2$

(a) 64

(b) 72

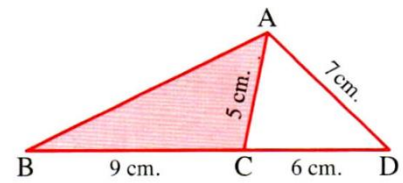
(c) 84

(d) 96

In the opposite figure :

The area of $\triangle ABC = \dots\dots\dots \text{cm}^2$

- (a) $6\sqrt{6}$ (b) $9\sqrt{6}$
(c) $9\sqrt{3}$ (d) $2\sqrt{6}$



$$(\sin x \cos x) (1 + \tan^2 x) (1 - \sin^2 x) = \dots\dots\dots$$

(a) 1

(b) $\sin 2x$

(c) $\frac{1}{2} \sin 2x$

(d) $2 \sin 2x$

If $\angle A$ supplements $\angle B$, then $\cos A \cos B - \sin A \sin B = \dots\dots\dots$

(a) zero

(b) 1

(c) -1

(d) 2

The slope of tangent to the curve $y = \sin 2x$ at $x = \frac{\pi}{2}$ equals

(a) 1

(b) zero

(c) -1

(d) -2

If $y = (\sin x + \cos x)^2$, then $\left(\frac{dy}{dx}\right)_{x=\frac{\pi}{4}} = \dots\dots\dots$

(a) 2

(b) - 2

(c) 0

(d) - 1

If $f(x) = \tan(5x - \pi)$, then $f\left(\frac{\pi}{4}\right) = \dots\dots\dots$

(a) 5

(b) $5\sqrt{2}$

(c) 10

(d) $10\sqrt{3}$

$$\lim_{h \rightarrow 0} \frac{\sin\left(\frac{\pi}{4} + h\right) - \sin\left(\frac{\pi}{4}\right)}{h} = \dots\dots\dots$$

(a) $\frac{\sin h}{h}$

(b) $\sin h$

(c) $\cos h$

(d) $\cos \frac{\pi}{4}$

If $y = \sin^2 x + \cos^2 x$, then $\frac{dy}{dx} = \dots\dots\dots$

- (a) $2 \sin x \cos x$ (b) $\cos 2x$ (c) zero (d) 1

$$\int \frac{d}{dX} (5 + \sin X) dX = \dots\dots\dots$$

- (a) $5X - \cos X$ (b) $5X + \sin X + c$ (c) $\sin X + c$ (d) $5X - \cos X + c$

$$\int \sin^2 x \sin 2x \, dx = \dots\dots\dots + c$$

(a) $\sin^2 x$

(b) $\sin 2x$

(c) $\frac{1}{2} \sin^3 x$

(d) $\frac{1}{2} \sin^4 x$

$$\int \tan^7 x \cot^7 x \, dx = \dots\dots\dots + c$$

- (a) $-x + \tan x$ (b) $x + \tan x$ (c) $-x + \cot x$ (d) x

$$\int (\sin^2 x + \cos^2 x) dx = \dots\dots\dots$$

(a) $\frac{1}{3} \sin^3 x + \frac{1}{3} \cos^3 x + c$

(b) $-\cos^2 x + \sin^2 x + c$

(c) $\sec^2 x + c$

(d) $x + c$

Find the equation of the tangent to the curve of the function $f : f(x) = 2 \tan x - \cos^2 x$ at the point $(0, -1)$.

Find the tangent equation to the curve of : $y = 2x \sin x \cos x$ when $x = \pi$

Best wishes

Mr. Michael Gamil

