Maths 10

Pre - Test 9

subject: *Trigonometry*

16 Mai 2019

ANSWERS

Question 1

Complete the following table with the *exact values* of the missing trigonometric functions.

Assuming α is in région I (acute angle)

$\sin(\alpha)$	$\cos(\alpha)$	$\tan(\alpha)$
$\frac{5}{13}$	$\sqrt{1-\left(\frac{5}{13}\right)^2}=\frac{12}{13}$	$\frac{5}{12}$
$\sqrt{1-\left(\frac{4}{5}\right)^2}=\frac{3}{5}$	$\frac{4}{5}$	$\frac{3}{4}$
$\sqrt{1-\left(\frac{6}{7}\right)^2}=\frac{\sqrt{13}}{7}$	$\frac{1}{\sqrt{1+\left(\frac{\sqrt{13}}{6}\right)^2}}=\frac{6}{7}$	$\frac{\sqrt{13}}{6}$

Assuming β is in région II

$\sin(\beta)$	$\cos(\beta)$	$\tan(\beta)$
$\frac{5}{13}$	$-\frac{12}{13}$	$-\frac{5}{12}$
$\frac{3}{5}$	$-\frac{4}{5}$	$-\frac{3}{4}$
$\frac{\sqrt{13}}{7}$	$-\frac{6}{7}$	$-\frac{\sqrt{13}}{6}$

Question 2

Complete the following table with approximate values

(using your calculator and the *inverse trigonometric functions*)

α^{o}	α rad	$\sin(\alpha)$	$\cos(\alpha)$	$\tan(\alpha)$
22.62	0.395	$\frac{5}{13}$	0.923	0.4167
36.87	0,644	0.6	$\frac{4}{5}$	0.75
31.01	0.54	0.515	0.857	0.601

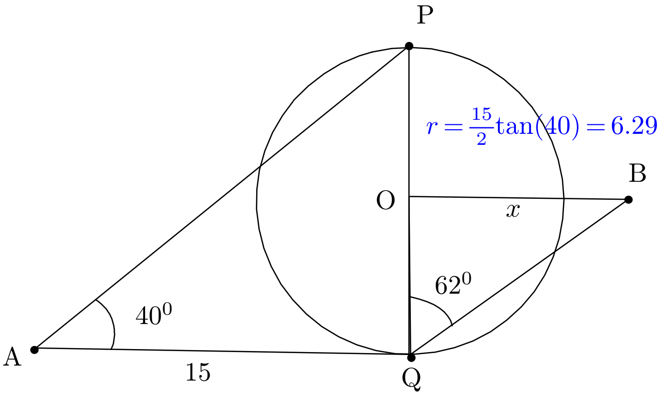
Question 3

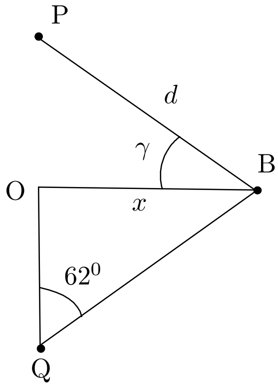
P and Q are placed on a circle of center O. ($\widehat{AQP}=\widehat{QOB}=90^0$)

i) Distance BO $\tan(62)=\frac{x}{r}\Rightarrow x=6.29\tan(62)=\boxed{11.86}$

ii) Distance between P and B. By Pythagoras : $d=\sqrt{x^2+r^2}=\boxed{13.4}$

iii) Angle $\gamma=\widehat{PBO}=\arctan\left(\frac{r}{x}\right)=\boxed{27.94^0}$



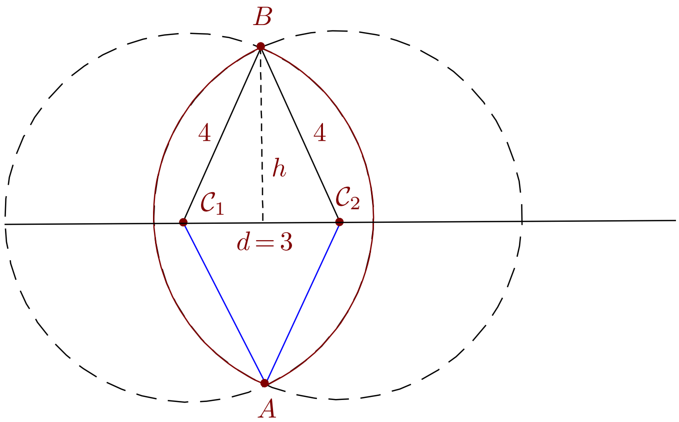


Question 4

Given that :

$-$Two circles of center $\mathcal{C}_1$ and $\mathcal{C}_2$ have same radius $r_1=r_2$=4cm.

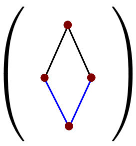
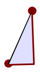
$-$ The distance between the centers is : $d(\mathcal{C}_1,\mathcal{C}_2)=3$cm



i) Angle $\widehat{\mathrm{C_1BC_2}} = 2\times\arcsin\left(\frac{1.5}{4}\right)=\boxed{44.05^0}$

ii) The *surface area* of the polygon $\mathcal{C}_1, A, \mathcal{C}_2$, B is $\mathcal{A}= 2\times\frac{3h}{2}=3\times 4\cos(22.025)=\boxed{11.12u^2}$

Notice

$\mathcal{A}\Bigg($  $\Bigg) = 4\ \mathcal{A}\ ($  $) = 4\ \frac{\frac{d}{2}h}{2} = dh$ where $h=4\cos\left(\frac{\widehat{\mathrm{C_1BC_2}}}{2}\right)$

You an also use $h=\sqrt{4^2-\left(\frac{3}{2}\right)^2}=\frac{\sqrt{55}}{2}$ that gives the exact expression $\boxed{\mathcal{A}=\frac{3\sqrt{55}}{2}}$

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