Lycée Des Arts
Hadat: Rue de Jamousee

Mark/ La note

Name/Le nom :
Class/ La Classe: G9 A.
Test in/ Examen de : Trial-1
Date/ La date: 14/12/2021
Time / La durée : 120 min

Correction standards

Ex-1 1) $r_1 = \sqrt{13^2 - 12^2} = \sqrt{169 - 144} = \sqrt{25} = 5cm$

$r_2 = \frac{9^3 - 3^4}{3^5} \times 9 = \left(\frac{3^6}{3^5} - \frac{3^4}{3^5}\right) \times 9 = \left(3 - \frac{1}{3}\right) \times 9$

So, $r_2 = 3 \times 9 - \frac{1}{3} \times 9 = 27 - 3$
$r_2 = 24cm$

$O_1O_2 = (5 - \sqrt{2})^2 + 2\sqrt{(1 + 5\sqrt{2})}$
$= 5^2 - 2(5)(\sqrt{2}) + (\sqrt{2})^2 + 2 + 10\sqrt{2}$
$= 25 - 10\sqrt{2} + 4 + 10\sqrt{2}$
$= 29cm.$

Since, $O_1O_2 = r_1 + r_2$
Thus, $(C_1)$ & $(C_2)$ are tangent externally. (a).

2) $AB = \frac{0.\bar{4} + \left(\frac{1}{3}\right)^2}{\left(1.\bar{3} - \frac{10}{3}\right)^2} \times 6^2$

$= \frac{0 + \frac{4}{9} + \frac{1}{9}}{\left(\frac{3 \times 1}{1 \times 3} + \frac{3 \div 3}{9 \div 3} - \frac{10}{3}\right)^2} \times 6^2$

$= \frac{\frac{5}{9}}{\left(-\frac{6}{3}\right)^2} \times 6^2$

$= \left[\frac{\frac{5}{9}}{\frac{(-2)^2}{1}}\right] \times 6^2$

$= \frac{5 \times 1}{9 \times 4} \times 3^2 \times 2^2 = 5cm.$

$AC = \frac{2.8 \times 10^{19} + 0.77 \times 10^{20}}{46 \times 10^{18} - 0.031 \times 10^{21}} - 3$

$= \frac{28 \times 10^{18} + 77 \times 10^{18}}{46 \times 10^{18} - 31 \times 10^{18}} - 3$

$= \frac{10^{18}(28 + 77)}{10^{18}(46 - 31)} - 3.$

$= \frac{105}{15} - 3.$

$= 7 - 3$

Thus, $AC = 4cm.$

$BC = \left(\frac{3}{7} + \frac{4}{7} \times \frac{5}{1} \div \frac{1}{3}\right) \times 3^{-1}$

$= \left(\frac{3}{7} + \frac{20}{7} \times 3\right) \times \frac{1}{3}$

$= \left(\frac{63}{7}\right) \times \frac{1}{3}$

So, $BC = \frac{63}{7 \times 3}$

then, $BC = 3cm$

Now, using converse of pythagorean theorem in $\triangle ABC$.

$\text{longest side}^2 \overset{?}{=} \text{leg}_1^2 + \text{leg}_2^2$

$AB^2 \overset{?}{=} BC^2 + AC^2$

$5^2 \overset{?}{=} 4^2 + 3^2$

$25 = 25$

Thus, $\triangle ABC$ is right at C. (a)

3. $[NI)$ is bisector of $M\hat{N}P$ (given)

So, $M\hat{N}I = I\hat{N}P$

Then $mes\,\overset{\frown}{MI} = mes\,\overset{\frown}{IP}$ (equal inscribed angles intercept equal arcs)

Thus, $I\hat{P}M = I\hat{M}P = \frac{1}{2} mes(\overset{\frown}{IP}) \text{ or } \frac{1}{2} mes(\overset{\frown}{IM})$ (inscribed angles intercepting equal arcs)

(a)

Ex-2. 1) $mes\,\overset{\frown}{AC} = \frac{(0.24)^2 \times (0.9)^2 \times (15) \times 2}{(-0.3)^4 \times (1.2)^2}$

$= \frac{(24 \times 10^{-2})^2 \times (9 \times 10^{-1})^2 \times 15 \times 2}{(3 \times 10^{-1})^4 \times (12 \times 10^{-1})^2}$

$= \frac{(24)^2 \times 10^{-4} \times \cancel{3^4} \times \cancel{10^{-2}} \times 15 \times 2}{\cancel{3^4} \times 10^{-4} \times 12^2 \times \cancel{10^{-2}}}$

$= \frac{\cancel{12^2} \times 2^2 \times 15 \times 2}{\cancel{12^2}}$

So, $mes\,\overset{\frown}{AC} = 120°$

Now, $A\hat{B}C = \frac{1}{2} mes\,\overset{\frown}{AC}$ (inscribed angle)

So, $A\hat{B}C = \frac{120°}{2}$

Thus, $A\hat{B}C = 60°$

$x\hat{C}A = \frac{1}{2}$ mes $\overset{\frown}{AC}$ ( angle formed between tangent & chord )

Thus $x\hat{C}A = 60°$.

2) In $\triangle AMC$ we have:

[MA) & [MC) are tangents to (c) at A & C resp. (given)

So, $MA = MC$ (tangent theorem: pt outside circle from which tangents are draw is equidistant from pts of tangencies)

but, $M\hat{C}A = 60°$ (proved)

Thus $\triangle AMC$ is equilateral ( 2 equal sides + $60°$)

Ex:3. 1) Drawn ✓

2) In $\triangle AMO$ we have:

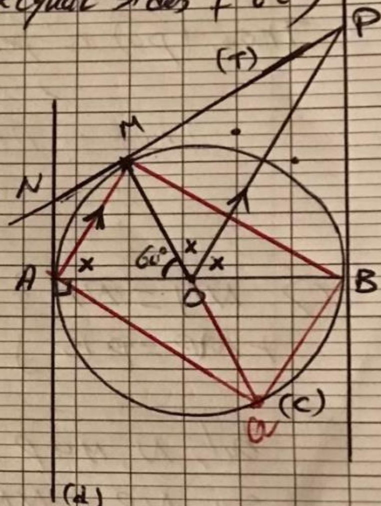
$OM = OA$ radii of (c) (given)

& mes $\overset{\frown}{AM} = 60°$.

So, $A\hat{O}M =$ mes $\overset{\frown}{AM}$ (central angle)

$= 60°$

Thus, $\triangle AMO$ is equilateral (having 2 equal sides + $60°$)




3a) In $\triangle$s $MOP$ & $OPB$ we have:

$(AM) \parallel (OP)$ (given)

So, $M\hat{A}O = P\hat{O}B = 60°$ (corresponding angles between $\parallel$ lines).

but, [AB] is a diameter of center O (given)

So, $M\hat{O}P = 180° - (A\hat{O}M + P\hat{O}B)$ (adj. supplementary angles)

So, $M\hat{O}P = 60°$

$\boxed{A}$ then, $M\hat{O}P = P\hat{O}B = 60°$

$\boxed{S}$ $OM = OB$ (radii of (c).

S [OB] is a common side.

Thus, $\triangle$s are equal by S.A.S property.

b) (PM) is tangent to (C) at M (given)
So, $O\hat{M}P = 90°$ (tangent theorem: angle between tangent & radius at pt of tangency) ... $\boxed{\text{rule-a}}$
But, △s MOP & OMB are equal (proved)
Then, $O\hat{B}P = 90°$ (corresponding elements).
but (PB) cuts (C) at B.
Thus, (PB) is tangent to (C) at B (tangent theorem: by ⓐ.

Now, [PM) & [PB) are tangents to (C) at M & B resp. (given + proved)
Thus, (PO) is perpendicular bisector of [MB] (tangent theorem: line joining center & pt from which tangents are drawn is perp. bisector of chord formed by pts of tangencies)

c) $NM = NA$ & $MP = PB$ } Tangent theorem: pt from which tangents are drawn is equidistant from pts of tangencies)
but, N, M & P are collinear.
So, $NP = NM + MP$.
Thus, $NP = NA + PB$ (by substitution)

4a. In quadrilateral MAQB we have:
Q is symm. of M w.r.t O (given)
• So, O is midpt of [QM].
O is center of (C) with diameter [AB] (given)
• So O is midpt of [AB]
& M is a pt on (C) of diameter [AB] (given)
So $A\hat{M}B = 90°$ (inscribed angle facing diameter)
Thus, MAQB is a rectangle (90 + diagonals bisect each other at same midpt)

b) $Area_{AQBM} = length \times with$

$= AM \times MB.$

In $\triangle AMB$ we have:

$A\hat{M}B = 90°$ (proved)

$\triangle AMO$ is equilateral (proved)

so, $M\hat{A}O = 60°$. (angle formed by sides an equi. $\triangle$)

then, $\triangle AMB$ is semi-equilateral at M $(90° + 60°)$

then, $AM = \frac{1}{2}$ hyp (side facing $30°$)

$= \frac{1}{2} AB$ $\quad$ $AB = 2r$

$= \frac{1}{2}(6)$ $\quad$ $= 2(3)$

$= 3cm$ $\quad$ $= 6cm$

and $MB = \sqrt{3}$.S.S (side facing $60°$)

$= \sqrt{3}(AM)$

$= 3\sqrt{3}$ cm

Thus, $Area_{AQBM} = 3 \times 3\sqrt{3}$

$= 9\sqrt{3}\ cm^2$.

14/12/2021. Rabih S Khater