

Mathematics Gr.10 Test 1 Memo

60 minutes

50 marks

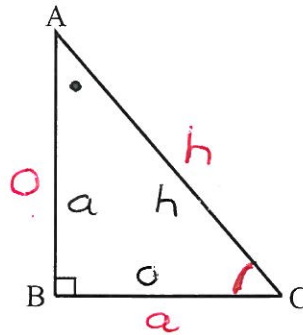
Question 1: [10]

Write the following in terms of the sides of the respective triangles:

1.1 (a) $\sin A$

(b) $\cot C$

(c) $\cos C$



(6)

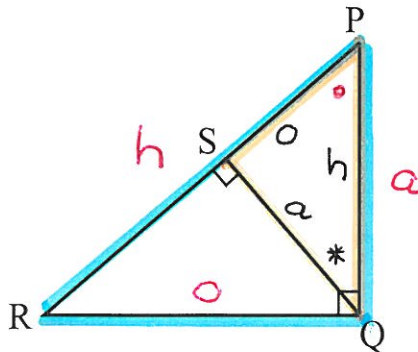
(a) $\sin A = \frac{o}{h} = \frac{BC}{AC}$ ✓ (2)

(b) $\cot C = \frac{a}{o} = \frac{BC}{AB}$ ✓ (2)

(c) $\cos C = \frac{a}{h} = \frac{BC}{AC}$ ✓ (2)

1.2 (a) $\tan P$ in $\triangle PQR$

(b) $\sin Q$ in $\triangle PQS$



(4)

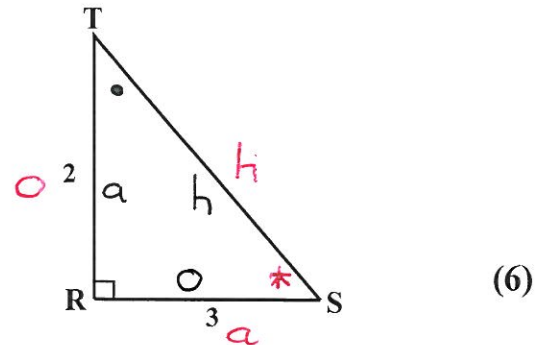
(a) $\tan P = \frac{o}{a} = \frac{RQ}{PQ}$ ✓ (2)

(b) $\sin Q = \frac{o}{h} = \frac{PS}{PQ}$ ✓ (2)

Question 2:[13]

Calculate the numerical value of the following:

- 2.1 (a) TS
(b) cosec T
(c) tan S



$$\begin{aligned} \text{(a) } TS^2 &= TR^2 + RS^2 \quad [\text{Pythagoras}] \\ &= (2)^2 + (3)^2 \\ &= 4 + 9 \quad (2) \end{aligned}$$

$$TS^2 = 13 \quad \text{(b) } \operatorname{cosec} T = \frac{h}{O} = \frac{TS}{RS} = \frac{\sqrt{13}}{3}$$

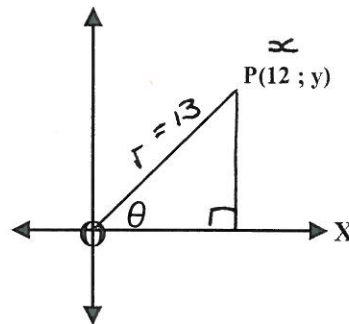
$$TS = \sqrt{13}$$

$$\text{(c) } \tan S = \frac{O}{a} = \frac{TR}{RS} = \frac{2}{3} \quad (2)$$

- 2.2 P(12; y) and OP = 13

Calculate:

- (a) y
(b) sin θ
(c) which function, in terms of θ , will be represented by the following:



$$\frac{12}{13}$$

(7)

$$\text{(a) } r^2 = x^2 + y^2 \quad [\text{Pythagoras}]$$

$$(13)^2 = (12)^2 + y^2$$

$$\therefore y^2 = 169 - 144$$

$$y^2 = 25 \quad (3)$$

$$y = 5$$

$$\text{(b) } \sin \theta = \frac{y}{r} = \frac{5}{13} \quad (2)$$

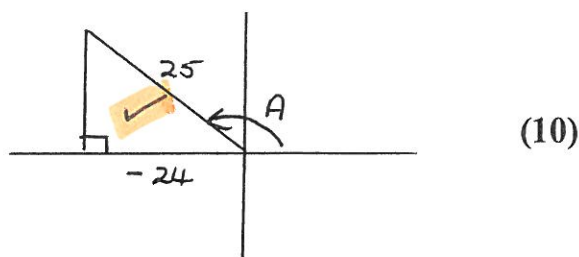
$$\text{(c) } \frac{12}{13} = \frac{x}{r} = \cos \theta \quad (2)$$

Question 3:[10]

If $25 \cos A + 24 = 0$ and $\tan A \leq 0$, calculate the following by using a diagram to represent the data:

(a) $\tan A \cdot \sin A$

(b) $\sin^2 A - \cos^2 A$



$$25 \cos A = -24$$

$$\cos A = \frac{-24}{25} \left(\frac{x}{r} \right)$$

$$\therefore r^2 = x^2 + y^2 \quad (4)$$

$$(25)^2 = (-24)^2 + y^2$$

$$y^2 = 625 - 576 = 49$$

$$\therefore y = 7$$

(a) $\tan A \cdot \sin A$

$$= \frac{7}{-24} \times \frac{7}{25} = -\frac{49}{600} \quad (3)$$

(b) $\sin^2 A - \cos^2 A$

$$= \left(\frac{7}{25} \right)^2 - \left(\frac{-24}{25} \right)^2 \quad (3)$$

$$= \frac{49}{625} - \frac{576}{625} = -\frac{527}{625}$$

Question 4:[15]

Use your calculator to answer the following:

4.1 If $P = 112^\circ$ and $Q = 63^\circ 18'$ calculate, correct to two decimals:

(a) $\sin(P + Q)$

$$= \sin(112^\circ + 63^\circ 18')$$

$$= 0,0819... \quad (2)$$

$$\approx 0,08$$

(b) $\cos^2 P - \tan Q$

$$= (\cos 112^\circ)^2 - \tan 63^\circ 18'$$

$$= -1,8479... \quad (2)$$

$$\approx -1,85$$

(c) $3,2 \cot Q$

$$= 3,2 \cot 63^\circ 18'$$

$$= 1,6094... \quad (2)$$

$$\approx 1,61$$

(d) $\sqrt{\sin P - 4 \cos P}$

$$= \sqrt{\sin 112^\circ - 4 \cos 112^\circ}$$

$$= 1,5574... \quad (2)$$

$$\approx 1,56$$

4.2 Find x in each of the following if $x \in [0^\circ; 90^\circ]$:
[Correct to one decimal]

(7)

(a) $\sin x = 0,234$

$$x = 13,532\dots$$

$$x \approx 13,5^\circ \quad \checkmark \quad (1)$$

(b) $2 \cos x = 0,2$

$$\cos x = \frac{0,2}{2} \quad \checkmark$$

$$\cos x = 0,1 \quad \checkmark \quad (3)$$

$$x \approx 84,3^\circ \quad \checkmark$$

(c) $\tan(2x - 10^\circ) = 3$

$$2x - 10 = 71,565\dots \quad \checkmark$$

$$2x = 81,565\dots \quad \checkmark \quad (3)$$

$$x \approx 40,8^\circ \quad \checkmark$$

Question 5:[2]

Simplify the following to one trigonometric function, where applicable:

5.1 $\frac{\sin A}{\cos A} = \underline{\tan A} \quad \checkmark \quad (1)$

5.2 $\cos B \cdot \sec B = \underline{1} \quad \checkmark \quad (1)$