

MONYETLA PROJECT SUMMER CAMP DEC 2020
MATHEMATICS
TRIGONOMETRY
GRADE 11
EXAM-TYPE QUESTION ANSWERS

QUESTION/VRAAG 5

5.1.1	$\cos 203^\circ = -\cos 23^\circ$ $= -p$	<ul style="list-style-type: none"> ✓ reduction/herlei ✓ answer/antw <p style="text-align: right;">(2)</p>
5.1.2	$\sin 293^\circ = -\sin 67^\circ$ $= -\cos 23^\circ$ $= -p$	<ul style="list-style-type: none"> ✓ reduction/herlei ✓ co-ratio/ko-verh ✓ answ/antw ito/v p <p style="text-align: right;">(3)</p>
5.2	$\frac{\sin(360^\circ - x) \cdot \tan(-x)}{\cos(180^\circ + x) \cdot (\sin^2 A + \cos^2 A)}$ $= \frac{(-\sin x)(-\tan x)}{(-\cos x)(1)}$ $= \frac{(-\sin x) \left(-\frac{\sin x}{\cos x} \right)}{-\cos x}$ $= -\frac{\sin^2 x}{\cos^2 x}$ $= -\tan^2 x$	<ul style="list-style-type: none"> ✓ $-\sin x$ ✓ $-\tan x$ ✓ $-\cos x$ ✓ 1 ✓ $\left(-\frac{\sin x}{\cos x} \right)$ ✓ $-\tan^2 x$ <p style="text-align: right;">(6)</p>
5.3.1	$\text{LHS} = \frac{\cos^2 x + (1 + \sin x)^2}{(1 + \sin x) \cdot \cos x}$ $= \frac{\cos^2 x + 1 + 2\sin x + \sin^2 x}{(1 + \sin x) \cdot \cos x}$ $= \frac{1 + 1 + 2\sin x}{(1 + \sin x) \cdot \cos x}$ $= \frac{2(1 + \sin x)}{(1 + \sin x) \cdot \cos x}$ $= \frac{2}{\cos x}$ $= \text{RHS}$	<ul style="list-style-type: none"> ✓ numerator/teller ✓ denominator/ noemer ✓ multiplication/ vermenigvuldiging ✓ identity/identiteit ✓ fact/faktor numerator/teller <p style="text-align: right;">(5)</p>
5.3.2	<p>Undefined if/ongedefinieerd as:</p> $\sin x = -1 \text{ or } \cos x = 0$ $\therefore x = 90^\circ ; 270^\circ$	<ul style="list-style-type: none"> ✓ 90° ✓ 270° <p style="text-align: right;">(2)</p>

5.5.1	$x^2 + y^2 = r^2$ $x^2 + (\sqrt{3})^2 = 2^2$ $x^2 = 1$ $x = \pm 1$ $x = 1 \quad (\text{since P lies in the 1}^{\text{st}} \text{ quadrant/aangesien P in die 1}^{\text{ste}} \text{ kwadrant lê})$	✓ subst ✓ $x = 1$ (2)
5.5.2	$\sin \hat{POT} = \frac{\sqrt{3}}{2}$ $\hat{POT} = 60^\circ$ $\hat{POT} + \alpha = 90^\circ$ $\alpha = 90^\circ - 60^\circ$ $= 30^\circ$	✓ correct ratio/ <i>korrekte verh</i> ✓ 60° ✓ answer/ <i>antw</i> (3)
5.5.3	$\sin(-30^\circ) = \frac{b}{20}$ $b = 20 \sin(-30^\circ)$ $b = -10$ $\cos(-30^\circ) = \frac{a}{20}$ $a = 20 \cos(-30^\circ)$ $a = 10\sqrt{3} \quad \text{OR/OF } 17,32$ $Q(10\sqrt{3}; -10) \quad \text{OR/OF } Q(17,32; -10)$ <p>OR/OF</p> $OQ^2 = 400$ $a^2 + b^2 = 400$ $PQ^2 = 2^2 + 20^2$ $PQ^2 = 404$ $(a-1)^2 + (b-\sqrt{3})^2 = 404$ $a^2 - 2a + 1 + b^2 - 2\sqrt{3}b + 3 = 404$ $400 - 2a + 4 - 2\sqrt{3}b = 404$ $2a = -2\sqrt{3}b$ $a = -\sqrt{3}b$ $(-\sqrt{3}b)^2 + b^2 = 400$ $4b^2 = 400$ $b^2 = 100$ $b = -10 \quad (b < 0)$ $a = -\sqrt{3}(-10)$ $a = 10\sqrt{3}$ $\therefore Q(10\sqrt{3}; -10)$	✓ correct ratio/ <i>korrekte verh</i> ✓ $b = 20 \sin(-30^\circ)$ ✓ $b = -10$ ✓ correct ratio/ <i>korrekte verh</i> ✓ $a = 10\sqrt{3} \quad \text{OR } 17,32$ ✓ subst into distance formula/ <i>subst in</i> <i>afstandformule</i> ✓ subst into distance formula/ <i>subst in</i> <i>afstandformule</i> ✓ $a = -\sqrt{3}b$ ✓ $b = -10$ ✓ $a = 10\sqrt{3} \quad \text{OR } 17,32$ (5)