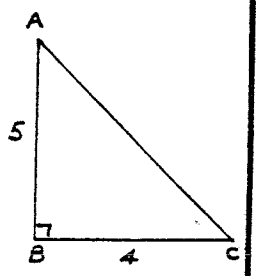
NAME : MAY TEST NO. 4 2 UNIT

QUESTION 1 : (10 marks)

(a) In the given triangle, evaluate



(i) length AC

(ii) $\tan \hat{A} =$

(iii) $\sec \hat{C} =$

(b) Find the value of x if :

(i) $\cos 25^\circ = \sin x^\circ$

(ii) $\sec 20^\circ = \operatorname{cosec}(x+30)^\circ$

(c) Fill in the table below : (with exact values)

DEG / RATIO	0°	30°	45°	60°	90°
sin	0°	$\frac{1}{2}$		$\frac{\sqrt{3}}{2}$	1
cos		$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$		0
cot	∞		1	$\frac{1}{\sqrt{3}}$	0

QUESTION 2 : (20 marks)

(a) Find the exact value of :

(i) $\sin 225^\circ$

(ii) $\tan 300^\circ$

(iii) $\cot 570^\circ$

(iv) $\cos(-120^\circ)$

(v) $\sec(-315^\circ)$

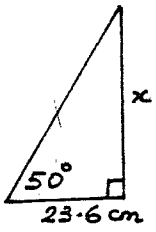
(b) Solve the equations for x if $0^\circ \leq x \leq 360^\circ$

(i) $\sin x = \frac{\sqrt{3}}{2}$

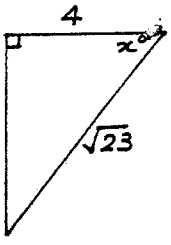
(ii) $\tan x = -\sqrt{3}$

(c) Find the value of x

(i) (to 1 d.p)



(ii) (to the nearest minute)



(d) If $x = 30^\circ$, $y = 45^\circ$ find the exact value of

(i) $\sin 2x$

(ii) $2 \sin y \cos y$

(iii) $\sec^2 x - \tan^2 x$

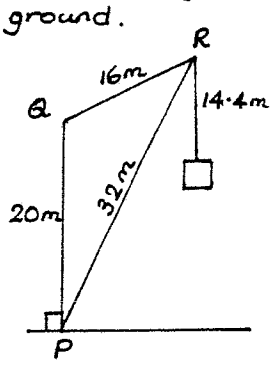
(iv) $\sqrt{1 - \cos^2 y}$

QUESTION 3 : (10 marks)

(i) (a) State the Sine Rule for any ΔABC

(b) ABCD is a parallelogram in which $\angle BAD = 40^\circ$, $AD = 37$ cm and $AC = 65$. Draw a neat sketch and find $\angle ACD$ (to nearest degree).

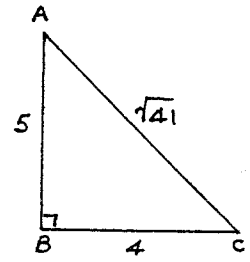
(ii) In the diagram PQR is a crane carrying a load at S. Calculate $\angle QPR$ and the height of S above the ground.



NAME: [redacted] MAY TEST NO. 4 (100%) Excellent effort 2 UNIT

QUESTION 1: (10marks)

(a) In the given triangle, evaluate



(i) length AC

$AC = 5^2 + 4^2$

$AC = \sqrt{41}$ ✓

(ii) $\tan \hat{A} = 4/5$ ✓

(iii) $\sec \hat{C} = \sqrt{41}/4$ ✓

(b) Find the value of x if:

(i) $\cos 25° = \sin x°$

$x° = 65°$ ✓

(ii) $\sec 20° = \operatorname{cosec}(x+30)°$

$x = 40°$ ✓

10

(c) Fill in the table below: (with exact values)

DEG / RATIO	0°	30°	45°	60°	90°
sin	0°	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$ ✓	$\frac{\sqrt{3}}{2}$	1
cos	1 ✓	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$ ✓	0
cot	∞	$\sqrt{3}$ ✓	1	$\frac{1}{\sqrt{3}}$	0

QUESTION 2: (20marks)

(a) Find the exact value of:

(i) $\sin 225°$

$-\frac{1}{\sqrt{2}}$ ✓

(ii) $\tan 300°$

$-\sqrt{3}$ ✓

(iii) $\cot 570°$

$\sqrt{3}$ ✓

(iv) $\cos(-120°)$

$-\frac{1}{2}$ ✓

(v) $\sec(-315°)$

$\sqrt{2}$ ✓

(b) Solve the equations for x if $0° \leq x \leq 360°$

(i) $\sin x = \frac{\sqrt{3}}{2}$

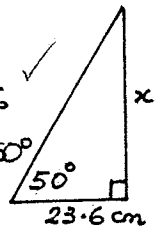
60°, 120° ✓

(ii) $\tan x = -\sqrt{3}$

120°, 300° ✓

(c) Find the value of x

(i) (to 1 d.p)

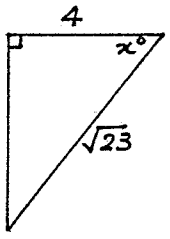


$\tan 50° = \frac{x}{23.6}$ ✓

$x = 23.6 \tan 50°$

$= 28.1$ cm ✓

(ii) (to the nearest minute)



$\cos x° = \frac{4}{\sqrt{23}}$ ✓

$x° = 33°29'$ ✓

(d) If $x = 30°$, $y = 45°$ find the exact value of

(i) $\sin 2x$ $\sqrt{3}/2$ ✓

(ii) $2 \sin y \cos y$

$2 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = \frac{2}{2} = 1$ ✓

(iii) $\sec^2 x - \tan^2 x$

$\frac{4}{3} - \frac{1}{3} = \frac{3}{3} = 1$ ✓

(iv) $\sqrt{1 - \cos^2 y}$

$\sqrt{1 - \left(\frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{2}}\right)}$

$= \sqrt{1 - \frac{1}{2}}$

$= \sqrt{1/2}$

$= \pm \frac{1}{\sqrt{2}}$ ✓

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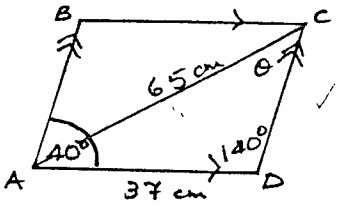
QUESTION 3: (10marks)

(i) (a) State the Sine Rule for any ΔABC

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ ✓

(b) ABCD is a parallelogram in which $\angle BAD = 40°$, $AD = 37$ cm and $AC = 65$. Draw a neat sketch and find $\angle ACD$ (to nearest degree).



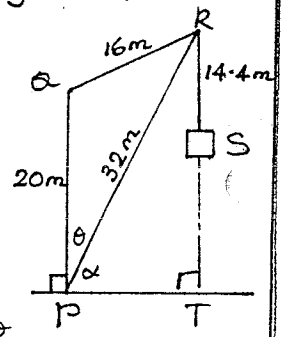
✓

$\frac{65}{\sin 140} = \frac{37}{\sin \theta}$ ✓

$\sin \theta = \frac{37 \sin 140}{65}$ ✓

$\angle ACD = 21°$ ✓

(ii) In the diagram PQR is a crane carrying a load at S. Calculate $\angle QPR$ and the height of S above the ground.



Let $\angle QPR = \theta$

$16^2 = 20^2 + 32^2 - 2 \cdot 20 \cdot 32 \cdot \cos\theta$ ✓

$256 = 400 + 1024 - 1280 \cos\theta$ ✓

$\frac{+1168}{+1280} = \cos\theta$ ✓

$\theta = 24°9'$ ✓

$\therefore \angle RPT = 65°51'$ ✓

$\frac{RT}{\sin 65°51'} = \frac{32}{\sin 90}$ (Rt $\angle$ triangle)

$RT = \frac{32 \sin 65°51'}{1}$ ✓

$RT = 29.2$ m ✓

$RT - RS = ST$

$\therefore ST = 14.8$ m ✓

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