

GATITU SECONDARY SCHOOL, P.O. BOX 327 - 01030, GATUNDU.
FORM 3 MATHEMATICS TUNE - UP EXAM. TERM 3 2013.

NAME: MARIONA SCHUMER ADM. CLASS

1. Form the quadratic equations whose roots are:-

a) 5 and $-\frac{1}{3}$

(4mks)

$$x = 5 \quad (x-5) \left(x + \frac{1}{3}\right)$$

$$x = -\frac{1}{3}$$

$$(x-5) \left(x + \frac{1}{3}\right)$$

$$x^2 + \frac{1}{3}x - 5x - \frac{5}{3} = 0$$

$$x^2 - \frac{14}{3}x - \frac{5}{3} = 0$$

$$\underline{\underline{3x^2 - 14x - 5 = 0}}$$

b) 7 and -11

$$(x-7)(x+11)$$

$$x^2 + 11x - 7x - 77 = 0$$

$$\underline{\underline{x^2 + 4x - 77 = 0}}$$

2. Find the minimum and the maximum possible perimeters of a regular hexagon whose side measures 12.6cm to one decimal place.

i. Minimum

(4mks)



$$A.E = \frac{0.1}{2}$$

$$12.55 \times 6$$

$$\underline{\underline{75.3 \text{ cm.}}}$$

ii. Maximum

$$12.65 \times 6$$

$$75.9 \text{ cm}$$

3. Find the amount after 5 years when sh 30,000 is invested at:-
 a) 11% p.a. simple interest.

(4mks)

$$I = \frac{PRT}{100}$$

$$30,000 \times 5 \times \frac{11}{100} = 16,500$$

$$\begin{array}{r} 30,000 \\ + 16,500 \\ \hline 46,500 \text{ F} \end{array}$$

b) 11% p.a. compound interest

$$A = P \left(1 + \frac{R}{100}\right)^n$$

$$A = 30,000 \left(1 + \frac{11}{100}\right)^5$$

$$30,000 (1.11)^5 = A$$

$$30,000 \times 1.6851 = 50,551.7$$

4. If θ lies between 0° and 180° and $\sin \theta = 0.5$, find the possible values of θ (2mks)

$$\sin \theta = 0.5$$

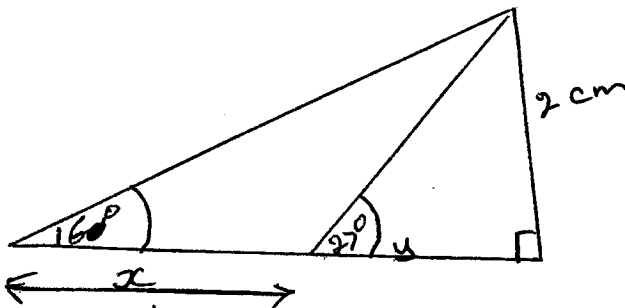
$$\theta = 30$$

$$180 - 30 = 150$$

$$\theta = 30^\circ \text{ or } 150^\circ$$

5. Find X in

(3mks)



$$\tan 27 = \frac{2}{y}$$

$$y = \frac{2}{\tan 27}$$

$$y = \frac{2}{0.5095}$$

$$y = 3.93$$

$$\tan 16 = \frac{2}{3.93 + x}$$

$$3.93 + x = \frac{2}{\tan 16}$$

$$3.93 + x = \frac{2}{0.2867}$$

$$3.93 + x = 6.976$$

$$x = 6.976$$

$$- 3.93$$

$$\underline{\underline{3.046 \text{ cm}}}$$

6. Evaluate $\sin 60 \cos 30$, leaving your answer in surd form. (2mks)

Tan $30^\circ \sin 45$

$$\frac{\sqrt{3}}{2} \times \frac{\sqrt{2}}{2}$$

$$\frac{1}{\sqrt{3}} \times \frac{1}{\sqrt{2}}$$

$$\frac{\frac{3}{4}}{\frac{1}{\sqrt{6}}}$$

$$\frac{3}{4} \times \frac{\sqrt{6}}{1}$$

$$\frac{3\sqrt{6}}{4}$$

7. Solve for X in

a) $\frac{2}{x-5} + \frac{3}{4x-1} = \frac{1}{5}$

$$\frac{2}{x-5} + \frac{3}{4x-1} = \frac{1}{5}$$

$$10(4x-1) + 15(x-5) = (x-5)(4x-1)$$

$$40x - 10 + 15x - 75 = 4x^2 - x - 20x + 5$$

b) $\frac{x}{x+5} + \frac{x+5}{x} = 10$

$$x^2 + x^2 + 10x + 25 = (x^2 + 5x)10$$

$$2x^2 + 10x + 25 = 10x^2 + 50x$$

$$8x^2 + 40x - 25 = 0$$

$$\frac{-40 \pm \sqrt{1600 + 800}}{16}$$

(4mks)

$$45x - 85 = x^2 - 21x + 5$$

$$x^2 - 66x + 90 = 0$$

$$x = \frac{66 \pm \sqrt{4356 - 320}}{2}$$

$$\frac{66 \pm \sqrt{4036}}{2}$$

$$\frac{129.5}{2}$$

$$64.76$$

or

$$\frac{3.53}{2} = \underline{\underline{1.765}}$$

$$\frac{-40 \pm 49}{16}$$

$$\frac{9}{16} = 0.5625$$

$$\frac{-89}{16} = \underline{\underline{-5.5625}}$$

8. A Man earns K 12928 p.a. Use the table below to calculate his P.A.Y.E per month. If he is entitled to sh 1056 per month personal relief. (4mks)

$$55x - 85 = 4x^2 - 21x + 5$$

$$4x^2 - 76x + 90 = 0$$

$$2x^2 - 38x + 45 = 0$$

$$\frac{38 \pm \sqrt{1444 - 360}}{4}$$

$$\frac{38 \pm \sqrt{1084}}{4}$$

$$\frac{38 \pm 33}{4}$$

$$\frac{71}{4} = 17.75$$

$$\frac{5}{4} = \underline{\underline{1.25}}$$

Income (k f p.a)	Rate (sh per)
1 - 5808	2
5809 - 11280	3
11281 - 16752	4
16753 - 22224	5
Over 22224	6

kf 12928

$$5808 \times 2 = 11616$$

$$5472 \times 3 = 16416$$

$$1648 \times 4 = 6592$$

$$\Omega 34,624$$

$$\begin{array}{r} 34624 \\ - 12672 \\ \hline \Omega 21,952 \\ \hline 12 \end{array}$$

$$\Omega \underline{\underline{1,829.3}}$$

9. Use suitable method to solve the following pair of simultaneous equations. (3mks)

$$Y = 3x^2 + 2x - 6$$

$$Y = x + 2$$

$$3x^2 + 2x - 6 = x + 2$$

$$3x^2 + x - 8 = 0$$

$$\frac{1 \pm \sqrt{1+96}}{6}$$

$$\frac{1 \pm \sqrt{97}}{6}$$

$$\frac{1 \pm 9.85}{6}$$

$$\underline{\underline{1.808}}$$

$$\frac{-8.85}{6} = \underline{\underline{-1.475}}$$

XXX.