GATITU SECONDARY SCHOOL P O BOX 327 01030 GATUNDU

MATHEMATICS FORM ONE TERM TWO

TIME 2HRS

---ADM--------------

NAME---

INSTRUCTOINS;

ANSWER all the questions on the spaces provided below each question showing ALL your workings.

1 Evaluate the following; $3 \frac{7}{8} + \dfrac{3\ 7/8 \div 7\ ¾}{5\ 1/10 + 2\ 9/10}$ (4mks)

$$3\frac{7}{8} + \sqrt{\dfrac{\frac{3+}{8} \times \frac{+1}{3+}}{\frac{2}{8}}} \quad M1$$

$$3 + \frac{7}{8} + \frac{2}{8}$$
$$= 4\frac{1}{8} \quad A1$$

$$= 3\frac{7}{8} + \sqrt{\dfrac{\frac{1}{2}}{8}} \quad M1$$

$$= 3\,7/8 + \frac{1}{4} \quad M1$$

2 Use tables to find squares of each of this numbers

(a) 0.32

$$0.32^2 = (3.2 \times 10^{-1})^2$$
$$= 3.2^2 \times (10^{-1})^2 \quad M1$$
$$= 10.240 \times 10^{-2}$$
$$= 0.1024 \quad A1$$

(b) 0.6128   (2mks each)

$$(0.6128)^2$$
$$= 6.128^2 \times 10^{-2} \quad M1$$
$$= 37.55 \times \frac{1}{100}$$
$$= 0.3755 \quad A1$$

(c) 0.0001497   (2mks each)

$$0.0001497^2$$
$$= (1.497 \times 10^{-4})^2$$
$$= 1.497^2 \times (10^{-4})^2 \quad M1$$
$$= 2.24 \times 10^{-8}$$
$$= 0.0000000224 \quad A1$$

3 Find using tables the square roots of each of the following numbers;

(a) 0.0529

$$\sqrt{0.0529}$$
$$= \sqrt{5.29 \times 10^{-2}}$$
$$= \sqrt{5.29} \times \sqrt{10^{-2}} \quad M1$$
$$= 2.3000 \times 10^{-1}$$
$$= 0.23 \quad A1$$

(b) 0.009823

$$\sqrt{0.009823}$$
$$= \sqrt{98.23 \times 10^{-4}}$$
$$= \sqrt{98.23} \times \sqrt{10^{-4}} \quad M1$$
$$= 9.9111 \times 10^{-2}$$
$$= 0.099911 \quad A1$$

(c) 689432   (2mks each)

$$\sqrt{689432}$$
$$= \sqrt{68.94 \times 10^4}$$
$$= \sqrt{68.94} \times 10^4 \quad M1$$
$$= 8.3025 \times 10^2$$
$$= 830.25 \quad A1$$

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4 Evaluate using tables

(a) <u>(0.706 X 20.5)²</u>
                 32.2

$Nu \left(0.706 \times 20.5\right)^2$

$= 0.706^2 \times 20.5^2$

$= \left(7.06 \times 10^-\right)^2 \times \left(2.05 \times 10^1\right)^2$

$= 7.06^2 \times (10^{-1})^2 \times 2.05^2 (10^1)^2$

$= 49.84 \times 10^{-2} \times 4.203 \times 10^2$ M

$= 0.4984 \times 420.3$

(b)<u>(23.5)² X 0.701²</u>
              3.4

$Numerator$

$(23.5)^2 \times (0.701)^2$ M

$= (2.35 \times 10^1)^2 \times (7.01 \times 10^{-1})^2$ M

$= 2.35^2 \times 7.01^2 \times 10^2 \times 10^{-2}$

$= 5.523 \times 49.14$

$= 271.400$ M

$= 209.4775$

Alter.

$\left(.706 \times 20.5\right)^2$

$= 14.47^2$

$= \left(1.447 \times 10^1\right)^2$

$= 1.447^2 \times (10^1)^2$

$= 2.094 \times 100$

$= 209.4$

$\dfrac{Numerator}{Den.}$

$= \dfrac{209.4775}{32.2}$ M

$= 6.5055$

or

$\dfrac{209.4}{32.2}$ M

$= 6.5031$ A

$\dfrac{N}{D} = \dfrac{271.400}{3.4}$ M

$= 79.8234$ A

(4mks)

(4mks)

5 Express as a single fraction in its lowest form

(a)<u>a²b</u> +<u>b²a</u> +<u>3</u>
    4ab   4ab   4

$\dfrac{a^2 b}{4ab} + \dfrac{b^2 a}{4ab} + \dfrac{3}{4}$ M

$= \dfrac{a^2 b + b^2 a + 3ab}{4ab} = \dfrac{ab(a+b+3)}{4ab}$ M

(3mks)

$= \dfrac{a+b+3}{4}$ A

(b) <u>1</u>   <u>(a +b)</u>   +<u>1</u>
    A²bc   ab²c   abc²

$\dfrac{1}{a^2 b c} + \dfrac{a+b}{ab^2 c} + \dfrac{1}{abc^2}$

$= \dfrac{bc + (a+b)ac + 1(ab)}{a^2 b^2 c^2}$ M

$= \dfrac{bc + a^2 c + abc + ab}{a^2 b^2 c^2}$ M

(3mks)

$= \dfrac{a^2 c + ab + abc + bc}{a^2 b^2 c^2}$ A

2

6 Which of the following ratios is greater?

(a) 2:3 or 1:4

$\frac{2}{3} = \frac{8}{12}$ ∴ 2:3 > 1:4

$\frac{1}{4} = \frac{3}{12}$ B1 M1

(b) 8 : 9 or 10 : 11

$\frac{8}{9} = \frac{88}{99}$ ∴ 10:11 > 8:9 M1

$\frac{10}{11} = \frac{90}{99}$ B1

(c) 5 : 2 Or 20:17   (2mks each)

$\frac{5}{2} = \frac{55}{34}$ ∴ 5:2 > 20:17

$\frac{20}{17} = \frac{40}{34}$ B1

7 Find the ratio a:c if;

a:b= 1:2 ,b : d = 4 ; 5, d : c =3 : 1

a, b ; d = 2 : 4 : 5 M1

a, b ; d : c = 6 : 12 : 15 : 5 M1

∴ a ; c = 6 : 5 M1

(3mks)

Alt:

a ; b = 1 : 2 ⟹ a = $\frac{b}{2}$

b ; d = $\frac{4}{5}$ ⟹ d = $\frac{5}{4}$b

d : c = 3:1 ⟹ d = 3c

a : c = $\frac{b}{2}$: $\frac{5b}{12}$

∴ a : c = 7 : 3

Alter:

$\frac{a}{b} = \frac{7}{1}$ ⟹ a = 7b

$\frac{b}{d} = \frac{1}{2}$ ⟹ d = 2b

= $\frac{b}{2} \times \frac{12}{5b}$ = 6:5

∴ a : c = 6:5

(3mks)

d : c = 2 : 3 ⟹ $\frac{d}{c} = \frac{2}{3}$ ⟹ c = $\frac{3d}{2}$

∴ c = $\frac{3(2b)}{2}$ = 3b

∴ a : c = 7b : 3b

= 7 : 3

a : b = 7 ; 1 ,b : d = 1 ; 2 ,d : e =2 : 3

a ; b = 7 : 1

b ; d = 1 ; 2

∴ a : b : d = 7 : 1 : 2 M1

d : c = 2 : 3 M1

∴ a ; b ; d : c = 7 : 1 : 2 : 3

8 Simplify by use of common factors

(a) 3bx – 3by + 4ax – 4ay

4a + 3b

$\frac{3b(x-y) + 4a(x-y)}{4a + 3b}$ M1

= $\frac{(4a+3b)(x-y)}{4a+3b}$ M1 = x - y

(b) $\frac{4xy - 3x + 8y^2 - 6y}{8y - 6}$

4xy + 8y² - 3x - 6y

4y(x + 2y) - 3(x + 2y)

= (4y - 3)(x + 2y)

(3mks)

∴ $\frac{4xy - 3x + 8y^2 - 6y}{8y - 6} = \frac{(4y-3)(x+2y)}{2(4y-3)}$

= $\frac{x+2y}{2}$ A1

9 A man invested sh 36000 in two companies P and Q. P pays a divided of 11 ¼% while Q pays a divided of 10 ½%. If from his total investment he obtained a return of 10 ¾%, how much money did he invest in each company?   *(4mks)*

Let him invest kshs X in Comp. P

investing in Com Q = 36000 - x

$\frac{x \times 11\frac{1}{4}}{100} + \frac{110\frac{1}{2}}{100}(36000 - x)$ =

11.25X + 110.5(36000 - x) =

111.25X + 3978 - 110.5x

0.75X + 3978 = 39870

$\frac{36000 \times 110\frac{3}{4}}{100}$ M1

39870.

∴ 0.75x = 90

∴ x = 12000

Q = 36000 - 12000

= 24,000.

10 The length of an arc of a circle is 9.42 cm. If the diameter of the circle is 10 cm, find the angle subtended by the arc at the center of the circle (3.142)   (3mks)
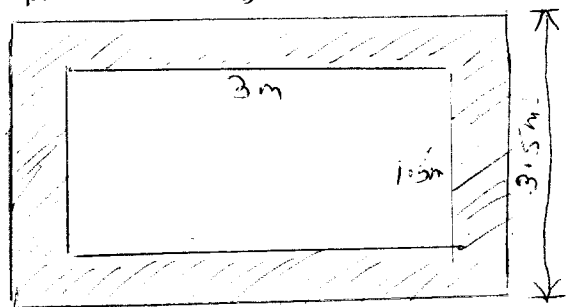
$$9.42 \, cm = \frac{\theta}{360} \times 3.142 \times 10$$

$$9.42 \, cm \times 36 = 3.142 \, \theta \quad M1$$

$$\therefore \theta = \frac{9.42 \times 36}{3.142} \quad M1$$

$$= 107.93^{\circ} \quad A1$$

11 A flower bed is measuring 3m by 1.5 m is surrounded by a path 1 m wide. Find the area of the path.   (4mks)

Area of shaded part
$$= (5 \times 3.5) - (3 \times 1.5) \quad M1 \quad M1$$
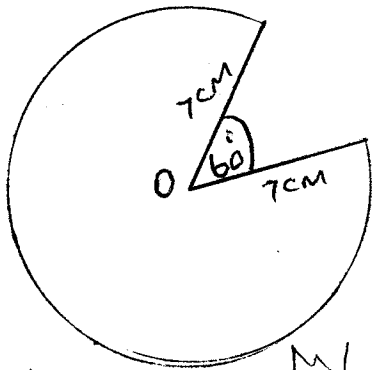$$= 17.5 - 4.5 = 13.0 \, m^2 \quad M1 \, A1$$

12 Tree tractors each working eight hours a day can plough a field in five days. How many days would two such tractors working 10 hours a day take to plough the same field?   (3mks)

3 tractors — 8hrs — 5 days
2 tractors — 10hrs —

$$\frac{3}{2} \times \frac{8}{10} \times 5 \quad M1 \, M1$$
$$= 6 \, days \quad A1$$

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13 Find the perimeter of the following figure.

7CM

7CM

O 60°

$$\frac{30\!\!\!/ \times 2 \times \frac{22}{7} \times 7}{36\!\!\!/} + 14 \quad M1$$

$$= 50.67 \quad M1$$

(3mks)

$$\frac{30\!\!\!/ \times 2 \times \frac{22}{7} \times 7 \times 7}{36\!\!\!/}$$

$$= \frac{30 \times 2 \times 22 \times 7}{36}$$

$$= 256.67 + 14$$

$$= 270.667$$

14 In a quality control analysis 3.5 % of all parts of a machine were declared sub-standard. If there were 72 sub-standard parts how many parts were analyzed?   (4mks)

$$3.5\% = 72$$

$$100\% = ? \quad M1$$

$$\frac{72}{3.5} \times 100 \quad M1$$

$$= 2057.1 \quad M1$$

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