

# FOCUS A365

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## FORM 3 TERM 1 MATHEMATICS PP1 EXAMINATIONS 2018

NAME: \_\_\_\_\_ ADM NO: \_\_\_\_\_ CLASS: \_\_\_\_\_

### Instructions

- Write your name, class and admission number.
- Answer all the questions in section 1 and ONLY Five in section II.
- Show all the calculations in the spaces provided
- KNEC mathematical tables and non-programmable calculators may be used.

### For Examiners Use

#### Section 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

#### Section 11

17	18	19	20	21	22	23	Total

Grand total

**SECTION I (50 Marks) Answer all Questions**

1. Without using a calculator evaluate.  $\frac{-2(5+3) - 9 \div 3 + 5}{-3x - 5 + -2 \times 4}$  [3 Marks]

2. A construction company employs technicians and artisans. On a certain day, 3 technicians and 2 artisans were hired and paid a total of Ksh. 9000. On another day, 4 technicians and 1 artisan were paid Kshs. 9500. Calculate the cost of hiring 2 technicians and 5 artisans in a day. [4 Marks]

3. A Kenyan bank buys and sells foreign currency as shown below

	Buying	selling
1 sterling pound	130.10	130.54
1 south African rand	9.52	9.58

A businessman on a trip to Kenya had 50 000 pounds which he converted to Kenyan shillings. While in Kenya he spent 80% of the money and changed the balance to south African rand. Calculate to the nearest rand the amount he obtained.

3mks

4. Given the exterior angle of a regular hexagon is  $x$ , find the size of each exterior angle of the hexagon. [3 Marks]

5. Two numbers  $p$  and  $q$  are such that  $p^3 \times q = 189$ . Find  $p$  and  $q$ . [3 Marks]

6. The volume of a cube is  $1728\text{cm}^3$ . Calculate correct to 2 decimal places the length of the diagonal of a face of the cube. [3 Marks]

7. Without using mathematical tables or calculator evaluate 4mks

$$27^{\frac{2}{3}} \times \left(\frac{81}{16}\right)^{-1/4}$$

8. Given the inequalities  $x - 5 \leq 3x - 8 < 2x - 3$

(a) Solve the inequalities;

[2 Marks]

(b) Represent the solution on a number line.

[1 Mark]

9. The production of milk in litres of 14 cows on a certain day was recorded as follows.  
22,26,15,19,20,16,27,15,19,22,21,20,22 and 28.

Determine

(a) The mode.

[1 Mark]

(b) The median.

[2 Marks]

10. Given that  $\mathbf{OA} = 2\mathbf{i} + 3\mathbf{j}$  and  $\mathbf{OB} = 3\mathbf{i} - 2\mathbf{j}$ , find the magnitude of  $\mathbf{AB}$  to one decimal place.

[3 Marks]

11. The vertices of a triangle are A(1,2) B(3,5) and C(4,1). The coordinates of C' the image of C under a translation vector T are (6-2).

(a) Determine the translation vector T.

[1 Mark]

(b) Find the coordinates of A' and B' under the translation vector T. [2 Marks]

12. Simplify the expression.  $\frac{x-1}{x} - \frac{2x+1}{3x}$

[1 Mark]

Hence solve the equation.  $\frac{x-1}{x} - \frac{2x+1}{3x} = \frac{2}{3}$

[2 Marks]

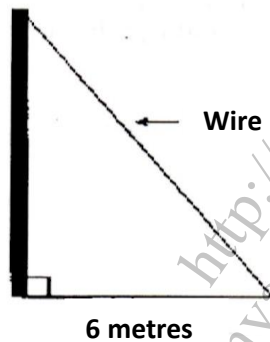
13. Use tables of reciprocals only to work out

$$\frac{3}{0.6735} + \frac{3}{0.156}$$

[3 Marks]

14. The cost of 2 jackets and 3 shirts was Ksh. 1800. After the cost of a jacket and that of a shirt were increased by 20% the cost of 6 jackets and 2 shirts was Kshs. 4800. Calculate new cost of a jacket and that of a shirt. [3 Marks]

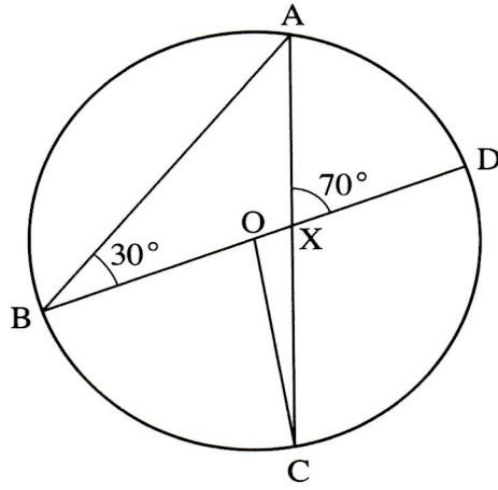
15. An electric pole is supported to stand vertically on a level ground by a tight wire. The wire is pegged at a distance of 6 metres from the foot of the pole as shown.



The angle which the wire makes with the ground is three times the angle it makes with the pole. Calculate the length of the wire to the nearest centimeter.

[3 Marks]

16. In the figure below, BOD is the diameter of the circle centre O. Angle ABD =  $30^\circ$  and angle AXD =  $70^\circ$ .



Determine the size of:

[2 Marks]

a) Reflex angle BOC

b) Angle ACO.

[1 Mark]

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**SECTION II (50 Marks) Answer any 5 Questions**

17. Three partners Kamau, John and James contributed a total of Kshs. 4,800,000 respectively in the ratio 4:5:7 to buy an 8 hectares piece of land. The partners set aside  $\frac{1}{4}$  of the land for social amenities and subdivided the rest into 15m by 25m plots.

(a) Find:

i. The amount of money contributed by James. [2 Marks]

ii. The number of plots that were obtained. [3 Marks]

(b) The partners sold the plots at Kshs. 50,000 each, spent 30% of the profit realized to pay for the administrative costs. They shared the rest of the profit in the ratio of their contributions.

i. Calculate the net profit realized. [3 Marks]

ii. Find the difference in the amount of the profit earned by Kamau and John. [2 Marks]

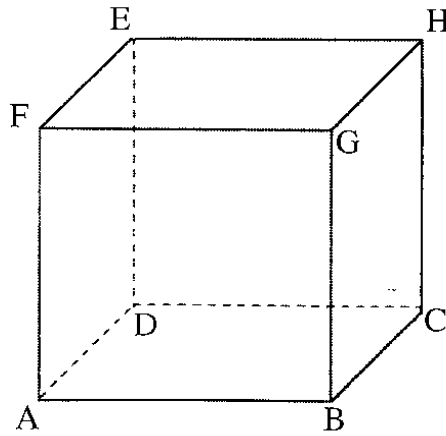


18. The figure below represents a solid cuboid ABCDEFGH with a rectangular base.

$AB=13\text{cm}$ ,  $BC= 5\text{cm}$  and  $CG = 15\text{cm}$ .

a. Determine the length of AB.

[1 Mark]



b. Calculate the surface area of the cuboid.

[3 Marks]

c. Given that the density of the material used to make the cuboid is  $7.6 \text{ g/cm}^3$ , calculate in the mass in kilograms.

[4 Marks]

d. Determine the number of such cuboids that can fit exactly in a container measuring  $1.5\text{m}$  by  $1.2\text{m}$  by  $1\text{m}$ .

[2 Marks]

19. The lengths, in cm, of pencils used by pupils in a standard one class on a certain day were recorded as follows.

3	7	9	9	20	14	10	6	8	13
14	3	17	13	8	12	5	15	14	15
7	12	11	6	10	19	9	14	6	9
10	16	13	9	12	11	10	7	10	11

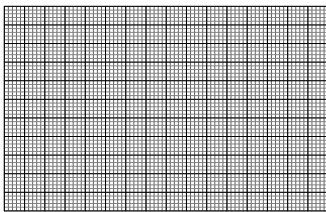
(a) Using a class width of 3, and starting with the shortest length of the pencils, make a frequency distribution table for the data. [3 Marks]

(b) Calculate:

(i) The mean length of the pencils [3 Marks]

(ii) The percentage of pencils that were longer than 8cm but shorter than 15cm. [1 Marks]

(c) On the grid provided, draw a frequency polygon for the data. [3 Marks]



20. Two lines  $L_1: 2y - 3x - 6 = 0$  and  $L_2: 3y + x - 20 = 0$  intersect at point A.

a. Find the coordinates of A. [3 Marks]

b. A third line  $L_3$  is perpendicular to  $L_2$  at point A. Find the equation of  $L_3$  in the form  $y = mx + c$ , where  $m$  and  $c$  are constants. [3 Marks]

c. Another  $L_4$  is parallel to  $L_1$  and passes through  $(-1, 3)$ . Find the  $x$  and  $y$  intercepts  $L_4$ . [4 Marks]

21. Three towns P, Q and R are such that P is on a bearing of  $120^\circ$  and 20km from Q.

Town R is on a bearing of  $220^\circ$  and 12km from Q.

a) Using a suitable scale, draw the position of P, Q and R. [4 Marks]

b) Find:

i. The distance between P and R in kilometers [2 Marks]

ii. The bearing of R from P [1 Mark]

iii. The bearing P from R [1 Mark]

iv. The bearing of Q from P [1 Mark]

v. The bearing of Q from R [1 Mark]

22. A saleswoman is paid a commission of 2% on goods sold worth over Ksh 100,000. She is also paid a monthly salary of Ksh 12,000. In a certain month, she sold 360 handbags at Kshs. 500 each.

a. Calculate the saleswoman's earnings that month. [3 Marks]

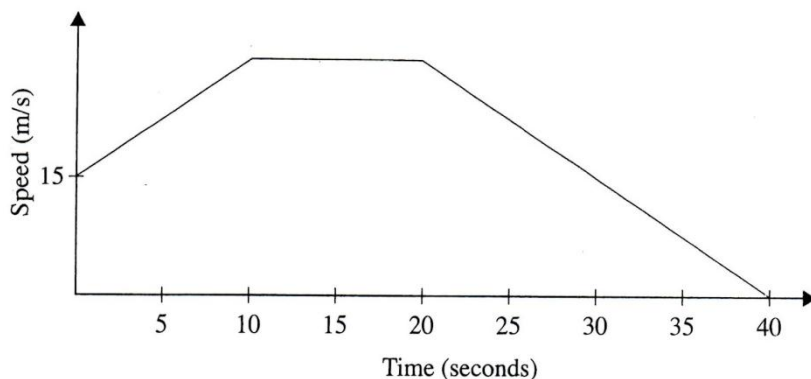
b. The following month, the saleswoman's monthly salary was increased by 10%. Her total earnings that month were Ksh 17,600. [2 Marks]

Calculate:

(i) The total amount of money received from the sales of handbags that month. [5 Marks]

(ii) The number of handbags sold that month. [2 Marks]

23. The figure below represents a speed time graph for a cheetah which covered 825m in 40 seconds.



- (a) State the speed of the cheetah when recording of its motion started [1 Mark]
- (b) Calculate the maximum speed attained by the cheetah [3 Marks]
- (c) Calculate the acceleration of the cheetah in:
- (i) The first 10 seconds [2 Marks]
- (ii) The last 20 seconds [1 Mark]
- (d) Calculate the average speed of the cheetah in first 20 seconds [3 Marks]

24. A solid S is made up a cylindrical part and a conical part. The height of the solid is 4.5 m. the common radius of the cylindrical part and the conical part is 09 m. the height of the conical part is 1.5 m.

a. Calculate the volume, correct to 1 decimal place, of solid S. [4 Marks]

b. Calculate the total surface area of solid S. [4 Marks]

c. A square base pillar of side 1.6 m has the same volume as solid S. determine the height of the pillar, correct to 1 decimal place. [2 Marks]

2017 no 19

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