NAME……………………………………………………ADM. NO……………CLASS………

# FOCUS A365

## ST CLAIRE HIGH SCHOOL – GATUNDU SOUTH

## MATHEMATICS FORM 1

## MID OF TERM 1 2017

### Instructions to candidate

1. Write your name and Adm. No in the space provided.
2. These papers consist of two sections; Section A and section B.
3. Answer all questions in section A and only 5 from section B.
4. Write all your working on the space provided.
5. Marks are awarded for steps which are correctly worked.
6. Calculators must not be used.

## Section I

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

## Section II

| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | Total |
|----|----|----|----|----|----|----|----|-------|
|    |    |    |    |    |    |    |    |       |

Time:   2hrs 30 min

Grand ☐ Total

**SECTION   50 MARKS**

1. Add one thousand and fourth four to the product of one thousand and six and one hundred

   And eighty. (3 marks)

2. The GCD of two numbers is 17 and their LCM is 140. If one of the numbers is 20, find the other number. (3 marks)

3. Find the L.C.M of $X^2$, $X^4$, $X^6$     (3 marks)

4. Evaluate  $\dfrac{-8 \div 2 + 12 \times 9 - 4 \times 6}{56 \div 7 \times 2}$                 (3 marks)

5. Evaluate $\frac{3}{8}$ of $\{\frac{73}{5} - \frac{1}{3}(\frac{11}{4} + \frac{31}{3}) \times \frac{22}{5}\}$    (3 marks)

6. Evaluate without using calculators or mathematical tables, leaving your answer as a simple fraction.

$$\frac{-4(-2)+(-12)\div(+3)}{-9-(15)} + \frac{-20+(+4)+(-6)}{46-(8+2)-3}$$    (4 marks)

7. A number m is such that when it is divided by 30, 36, and 45 the remainder is always 7, find the smallest possible value of m.    (3 marks)

8. Which of the following number is divisible by both 3 and 4?    (3 marks)
   $120, 744, 306, 9564, 1504, 192, 86 \ and \ 36.$

9. What must be added to the underlined number below to make it divisible by 11, (3 marks)

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10. If $x = -2$, $y = -6$ and $z = 4$, find the value of $\dfrac{4xy}{z}$ (3 marks)

11. Show the following operation on a number line (2 marks)

$(-7) + (-2) + (+6)$

Hence, evaluate the value of, $(-7) + (-2) + (+6)$ (1 mark)

12. Change the recurring decimal into fraction, $3.2\dot{5}\dot{6}$ (3 marks)

13. By how much is the product of $\frac{9}{5}$ and $8\frac{1}{2}$ greater than 5?　　　(3 marks)

14. Evaluate, $(\frac{5}{7} \times \frac{2}{3}) + (\frac{5}{6} - \frac{8}{9}) \div \frac{7}{15} \, of \, \frac{5}{6}$　　　(3 marks)

15. The distance between two schools m and k is 2km. A market is situated between m and k one third of the distance from m and k. How far is the market from k?　(3 marks)

16. A square room is covered by a number of whole rectangular slabs of sides 60cm and 42cm.

　　Calculate the least possible area of the room in square metres.　(4 marks)

SECTION B    50 MARKS

17. Kinyua spent $\frac{1}{4}$ of his net January salary on school fees. He spent $\frac{1}{4}$ of the remainder on

electricity and water bills. He spent $\frac{1}{9}$ of what remained on transport. If he finally had

sh.3,400, calculate

a) His net January salary.      (5 marks)

b) Money spent on school fees.    (1 mark)

c) Money spent on transport.    (2 marks)

d) Money spent on electricity and water bills.

18. A minibus had 23 passengers at the beginning of a journey. Twelve passengers alighted at the first
stop while 9 boarded six of those who boarded at the first stop alighted at the second stop and 12 got in.
The minibus should not stop again up to the final destination. The charges from the starting point were
sh. 50 up to the first stop, sh. 70 up to the second stop and sh. 85 up to the final destination.

a) How many passengers alighted at the final destination?    (3 marks)

b) How many passengers were ferried by the minibus through the journey? (3 marks)

c)  How much money was collected during the trip?     (4 marks)

19. Find all the possible values of the missing digit(s) represented by   (*)      (10 marks)

a)  2*6,   8*71,   8*919    are divisible by 11.

b) 396*5,  48675*,  349** are divisible by 9.

c) 3*7,  1*43,  81*60  are divisible by 3.

d)  93*, 85*2,  90*4   are divisible by 4.

20. Mr. Kamau  wishes to buy some items for his son and daughter. The son's item costs sh. 324 while the daughter item costs sh. 220 each. Mr. Kamau would like to give each of them equal amount of money.

a) What is the least amount of money that he can send to each of them so that the money is

fully utilized for items without remainder.    (5 marks)

b) How many items will each person buys.      (5 marks)

21. In 2010, Musa got 750 bags of coffee from his shamba. In 2011 his yield dropped by 30% due to drought and in 2012 his yield rose by 15% over that of 2011. A bag of coffee weighs 55kg and Musa was paid sh. 7900 per tone in 2010. Thereafter the price per tone increased each year by 10%. Find his earning from coffee for each of the three years. Hence, find his total income from coffee for three years. (10 marks)
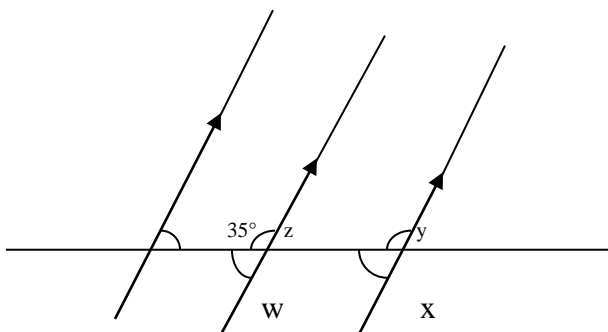
22. a)  The Highest Common Factor( HCF) of 182 and x is 26 and the L.C.M of 182 and x is 1092. Determine the value of x.          (3 marks)

  a)  Muigai had sh. P; Nzau had four times as much as Muigai. Muli had half as much as Nzau.
   i)        Write an expression that gives the total amount of money the three people had.      (1 mark)

ii)     If p = sh. 1500, how much money did they have altogether?    (3 marks)

b)



Find the values of x, y, w, and z giving reason.                    (4 marks)

23. Five companies employed 2340, 3455, 675, 960 and 1350 workers. The first company laid off 1 worker for every 5 workers, while the other three recruited 2 new workers for every 3.

   a) What was the total number of workers at the beginning?    (2 marks)

  b)  How many people:
      i)      Lost job            (3 marks)

      ii)     Got job           (3 marks)

  c)  What was the total number of workers finally?    (2 marks)

24. a) The masses in kilograms of 20 bags of maize were; 90, 94, 96, 98, 99, 102, 105, 91, 102, 99, 105, 94, 99, 90, 94, 99, 98, 96, 102, and 105.

    i.     State the mode.  (1mk

    ii.    Calculate the mean mass per bag   (4 marks)
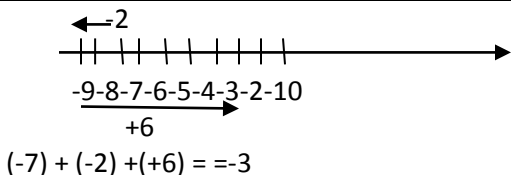
b) A fruit vendor bought 1948 oranges on a Thursday and sold 750 of them on the same day. On Friday, he sold 240 more oranges than on Thursday. On Saturday, he bought 560 more oranges. Later the day, he sold all the oranges he had at a price of Ksh. 8 each. Calculate the amount of money the vendor obtained from the sales of Saturday.     (5 marks)
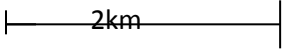
## Marking scheme

| No. | Working | Marks | |
|-----|---------|-------|---|
| 1. | 1044 + 1006×180<br>   1006×180=181080<br>1044+181080= 182,124 | $M_1$<br>$M_1$, Ans $_1$ | Long method only |
| 2. | Let the number be x<br>LCM=<u>product of the number</u><br>     GCD of the number<br>140 = $\dfrac{20 \times x}{20}$<br>X = $\dfrac{140 \times 7}{20}$<br>X = 49 | $M_1$<br><br>$M_1$<br><br>$A_1$ | Mark alternative method. |
| 3. | $X^2 + x = x(x+1)$<br>$X_2-1= (x+1)(x-1)$<br>$X^2-x =x(x-1)$<br>$X(x+1)(x-1)$<br>$X^3-x$ | $M_1$<br><br>$M_1$<br><br>$A_1$ | |
| 4. | $\dfrac{-4+108-24}{56 \div 7 \times 2}$<br>$\dfrac{-4+108-24}{16}$<br>$^{80}/_{16} = 5$ | $M_1$<br><br>$M_1$<br><br>$A_1$ | Numerator<br><br>Denominator<br><br>Accuracy |
| 5. | $^3/_8 \left( {}^{38}/_5 - {}^{55}/_{36} \times {}^{12}/_5 \right)$<br><br>$^3/_8 \times {}^{59}/_{40} = 1\,{}^{19}/_{40}$ | $M_1$<br><br>$M_1$, $A_1$ | |
| 6. | $\dfrac{8+(-4)}{-24} + \dfrac{-22}{33}$<br><br>$^4/_{-24} - {}^{22}/_{33} = {}^{-1}/_6 - {}^2/_3$<br>$\dfrac{-3-12}{18} = {}^{-15}/_{18} = {}^{-5}/_8$ | $M_1$<br><br>$M_1$<br><br>$M_1$<br>$A_1$ | |
| 7. | L.C.M of 30, 36, and 45 <br><table><tr><td></td><td>30</td><td>36</td><td>45</td></tr><tr><td>2</td><td>15</td><td>18</td><td>45</td></tr><tr><td>2</td><td>15</td><td>9</td><td>45</td></tr><tr><td>3</td><td>5</td><td>3</td><td>15</td></tr><tr><td>3</td><td>5</td><td>1</td><td>5</td></tr><tr><td>5</td><td>1</td><td>1</td><td>1</td></tr></table>L.C.M = $2^2 \times 3^2 \times 5 = 180$<br><br>M=180+7=187 | $M_1$<br><br><br><br><br><br><br><br>$M_1$<br><br>$A_1$ | |

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| | | | |
|---|---|---|---|
| 8. | 36, 192, 120, 744, and 9564 | 3mks<br>1 mk<br>0 mk | All listed<br>When 2 numbers wrong<br>More than 2 numbers wrong |
| 9. | 8+6+4+9=27<br>2+0+x<br>27-(2+x)=11<br>27-2-x=11<br>X=27-2-11<br>X=27-13=14<br><br>14 can not be the answer,<br>27-(2+x)= 22<br>27-2-x=22<br>X=27-2-22<br>X=27-24<br>X=3 | $M_1$<br><br>$M_1$<br><br><br>$A_1$ | But only one digit needed |
| 10. | $\dfrac{4\times(-2)\times(-6)}{4}$<br>=12 | $M_1$<br><br>$A_1$ | |
| 11. | <br>-9-8-7-6-5-4-3-2-10<br>$+6$<br>$(-7) + (-2) +(+6) = = -3$ | | |
| 12. | $R=3.25\dot{6}$<br>10r=32.5656….<br>1000r=3256.565656…..<br>990r=3256.5656….<br>-     32.5656….<br>3224.0000….<br><br>R=3224/990 | $M_1$<br><br><br>$M_1$<br><br><br><br>$A_1$ | |
| 13. | $^9/_5 \times {}^{33}/_4 = {}^{297}/_{20}$<br><br>$^{297}/_{20} - 5$<br>$= 14^{17}/_{20} - 5$<br>$= 9^{17}/_{20}$ | $M_1$<br><br><br>$M_1$<br><br>$A_1$ | |
| 14 | $^{10}/_{21} + (^{-1}/_{18}) \div {}^7/_{18}$<br>$^{10}/_{21} + (^{-1}/_{18} \times {}^{18}/_7)$<br>$= {}^{10}/_{21} - {}^1/_7$<br><br>$^{10}/_{21} - {}^3/_{21}$<br><br>$= {}^7/_{21} = {}^1/_3$ | $M\ 1$<br><br>$M_1$<br><br>$A_1$ | |

| 15. | | M$_1$ | |
|---|---|---|---|
| | ⊢———— 2km ————⊣ |⊦ | | |
| | 1/3×2 | | |
| | = 2/3 | M$_1$ | |
| | Distance from k= 2-$^2/_3$ | | |
| | = 1$^1/_3$ | A$_1$ | |

| 16. | L.C.M of 60 and 42 | | |
|---|---|---|---|

|  | 60 | 42 |
|---|---|---|
| 2 | 30 | 21 |
| 2 | 15 | 21 |
| 3 | 5 | 7 |
| 5 | 1 | 7 |
| 7 | 1 | 1 |

|  |  |
|---|---|
| L.C.M = $2^2$×3×5×7 <br> =420 | M$_1$ |
| Area = 4.2×4.2 <br> =17.64M$^2$ | M$_1$ <br><br> A$_1$ |

| 17. | a) Let his salary be sh. X | | |
|---|---|---|---|
| | School fees $^1/_4$x | | |
| | Remaining $^3/_4$x | M 1 | |
| | Electricity and water bills $^1/_4$x × $^3/_4$x | | |
| | = $^3/_{16}$x | M 1 | |
| | Remaining $^3/_4$x − $^3/_{16}$x | | |
| | =$^9/_{16}$x | M 1 | |
| | Transport $^1/_9$×$^9/_{16}$x | | |
| | = 1/16x | | |
| | Remaining = $^9/_{16}$x − $^1/_{16}$x | M 1 | |
| | = $^8/_{16}$x = $^1/_2$x | | |
| | $^1/_2$x=3,400 | | |
| | X = 3,400×2 | A 1 | |
| | =6,800 | | |
| | b) School fees = $^1/_4$×6,800 | A$_1$ | |
| | =sh. 1,700 | | |
| | c) Transport = $^1/_{16}$x x | A$_2$ | |
| | $^1/_{16}$×6,800 | | |
| | Sh. 425 | | |

| | | | |
|---|---|---|---|
| | d) Electricity and water bills<br><br>$^3/_{16}x = {}^3/_{16} \times 6{,}800$<br>Sh. 1,275 | A 2 | |
| 18 | Let B be the beginning and E stand for end of the<br><br>B    23p      20p      26<br>├──┬──────┬──────┤ E<br>   1ˢᵗ      2ⁿᵈ<br>stop      stop<br><br>1ˢᵗ 23-23 = 11<br>9+11= 20<br>2ⁿᵈ stop 9-6= 3    20-6= 14<br> Final destination 14 + 12= 26 Passangers | M 1<br><br><br><br>M 1<br><br><br>A 1 | |
| | b) 23+9+12<br>=44 Passangers | M 1<br>A 1 | |
| | c)12×50 = sh. 600<br>   11×85= sh.935<br>    6×20 = sh.120<br>    3×35 = sh.105<br>   12×15 = sh. 180<br>   ─────────────<br>        Sh. 1,940 | M 1<br><br>M 2<br><br><br><br><br>A 1 | |
| 19. | a) i) 2+6-*=0   *=8<br>   ii)8+7-*+1 = 11<br>    14-* = 11   *=14-11= 3<br>   iii) 8+9+9-*+1 = 22<br>     26-*-1 = 22   *= 25-22 = 3 | M 1<br><br>M 1<br><br><br>A 1 | |
| | b) i) 3+9+6+*+5<br>   23+* sum divisible by 9<br>   23+* = 27    * = 27-23 = 4<br><br>   ii)4+8+6+7+5+*<br>30+* = 36<br> *36-30 = 6<br><br>   iii)3+4+9+*+*<br>    16+*+* = 18<br>*+* = 18-16 =2<br>  *   *<br>  2   0<br>  0   2    MaRK FOR OTHERS THAT ARE CORRECT | M 1<br><br>A 1 | |
| C) | i) 3+*+7 = 12<br>   *= 2<br>   ii) * 1 | M 1<br>A 1 | |

| | | | |
|---|---|---|---|
| | iii) * 0    Mark for other values that are correct | | |
| d) | i)  *= 2<br>ii) * =3        NB:  There could be other numbers<br>iii * = 0 | M 1<br><br>A 1 | |
| 20. | L.C.M of 324 and 220<br>a)<br><br>| | 324 | 220 |<br>|---|---|---|<br>| 2 | 162 | 110 |<br>| 2 | 81 | 55 |<br>| 3 | 27 | 55 |<br>| 3 | 9 | 55 |<br>| 3 | 3 | 55 |<br>| 3 | 1 | 55 |<br>| 5 | 1 | 11 |<br>| 11 | 1 | 1 |<br><br>LCM = $2^2 \times 3^4 \times 5 \times 11$<br>     = 17, 820 | <br><br><br><br><br><br><br><br><br><br>M 1<br><br>A 1 | |
| | b) i) son  17820/324<br><br>   = 55 items<br><br><br>ii)  daughter    17820/220<br><br>    = 81 items | A 2<br><br><br><br><br>A 2 | |

| 21. | | | |
|---|---|---|---|
| 2010 = 750 =100% | | | |

2010 = 750 =100%

2011 (100-30)% of 750 bags-B 1

    70/100×750

     =525 Bags-  B 1

2012   115/100×525

     603.75 Bags-  Bags


2010   750 × 55= 41250kg

     1 ton= 1000kg

   41250kg

   41250/1000

    = 41.25 tonnes − M 1

   1 tonne = 7900

   41.25 tonne = ?

  7900×41.25 = sh. 325875 − B 1

2011   $\underline{525×55}$      × $^{110}/_{100}$×7900

     1000

   = sh. 250923.75 − M 1

 2012   603.75/1000×55   B 1

     110/100×8690 = sh. 317418

Total   325875.00     M 1

     250923.75

     $\underline{317418.54}$

      894217.29    A 1

| | | | |
|---|---|---|---|
| 22. | a) x = $\dfrac{GCD \times LCM}{\text{given}}$<br><br>= $\dfrac{26 \times 1092}{182}$<br><br>= 156<br><br>Or: GCD = 26 = 2×13<br><br>LCM = 1096 = $2^2$×3×7×13<br>182 = 2×7×13<br>Comparing factors of GCD and LCM and 182<br>X = $2^2$×3×13 = 156<br>NB: For LCM; Common factors with lowest power<br>GCD common factors with lowest power | M 1<br><br>A 2 | |
| | b) Muigai = sh p<br><br>Nzau = sh 4p<br><br>Muli = sh. 2p<br><br>i) Total = p+4p+2p = 7p<br>ii) P= sh 1500<br><br>Muigai 1500<br><br>Nzau 6000<br><br>Muli <u>3000</u><br><br>total Sh. 10500 | M 1<br><br>M 1<br><br>M1<br><br>A 1 | |
| | c) w = 35° - vertically opposite angles are equal<br><br>x = 35° - corresponding angles<br><br>y = (180-35)°<br><br>= 145° Supplementally angles<br><br>Z = 145° Corresponding angles sum is equal to 180° | A 1<br><br>A 1<br><br>A 1<br><br>A 1 | |
| 23. | a) 2340 + 3455 + 675 + 960 + 1350<br><br>= 8780 | A 2 | |

| | | | |
|---|---|---|---|
| | b) i) lost job<br><br>$\frac{2340}{5}$ + $\frac{3455}{5}$<br><br>468 + 691<br><br>= 1159 | M 1<br><br>M 1<br><br>A 1 | |
| | iii)      Got jobs<br><br>$\frac{675}{3}$ + $\frac{960}{3}$ + $\frac{1350}{3}$<br><br>225 + 320 450<br><br>= 995 ×2<br><br>=1990 | M 1<br><br>M 1<br><br><br>A 1 | |
| | c)  8780 + 1990 − 1159<br><br>= 9,611 | M 1<br><br>A 1 | |

24.

a)

| Mass | Frequency | fx |
|------|-----------|-----|
| 90 | 2 | 180 |
| 91 | 1 | 91 |
| 94 | 3 | 282 |
| 96 | 2 | 192 |
| 98 | 2 | 196 |
| 99 | 4 | 396 |
| 102 | 3 | 306 |
| 105 | 3 | 315 |

         20          1958

A 1

i)     Mode=94   Number repeated

many times

A 1

ii)    Mean 1958/20

iii)    =97.9

A 1

b) Thusday bought = 1948        M 1

  Sold          = 750

  Balance       = 1,198       M 1

  Friday;    sold 240 + 750 = 990

             M 1

        Balance = 1,198-990

            = 208

  Saturday; Bought  560      M 1

Total on sat 560 + 208 =768

  Money   =  768 ×8 = Ksh. 6144    A 1

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