**MATHEMATICS**

**PAPER 2**

**MARKING SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **MAIN SCHEME** | **MARKS** | **COMMENTS** |
| 1 | Perimeter = 2(l + w)  Absolute error for both length and width = 0.5  Max perimeter = 2(80.5 + 60.5)  = 282  Actual perimeter = 2(80 + 60)  = 280  Percentage error = x 100  = 0.714 0.7 | B1  M1  A1 | For either max, actual or min perimeter |
|  |  | 03 |  |
| 2 | Det (Δ) = (4 x -2) – (3 x 5)  = -8 – 15 = -23  =  =  x = 3, y = 2 | B1  B1  M1  A1 |  |
|  |  | 04 |  |
| 3 | 5(5x)2 – 15(5x) + 10 = 0  Let 5x be A  5A2 – 15A + 10 = 0  (A – 2) (A – 1) = 0  A = 2 **or**  1  5x = 2 **or** 5x = 1  x = **or** x = 0 | M1  M1  A1  B1 | For ✓quad equation formed  Or subst in quadration formula  For both |
|  |  | 04 |  |
| 4 | x + 3x – 30o = 90o  1  2  30  4x = 120  x = 30  tan 30o = | B1  B1  B1 |  |
|  |  | 03 |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | | ∠WXZ = 180 – 60o  = 120o  ∠ZWX = 180 – (50 + 120)  = 10o  ∠YZW = 10o alternate angles to ZWX | | B1  B1 | |  | |
|  | |  | | 02 | |  | |
| 6 | | 1. Cost of the mixture   =  =  = 156.36  156/- to the nearest shilling   1. % profit = ?   250 – 156  = 94  x 100 | | M1  A1  M1  A1 | | To the nearest shilling  2 d.p | |
|  | |  | | 04 | |  | |
| 7 | |  | | M1  M1  A1 | |  | |
|  | |  | | 03 | |  | |
| 8 | | 3.1522 = 9.9351  3 x 0.1540 + 4 x 0.1007  0.462 + 0.4028  = 0.8648 | | B1  M1  M1  A1 | | For both and square | |
|  | |  | | 04 | |  | |
| 9 | | M =  P = m + mk2  m = P – mk2  h = | | M1  M1  A1 | |  | |
|  | |  | | 03 | |  | |
| 10 | | Let one of the sides be a  = 18 x 0.8660  = 15.588  = 15.59 cm | | M1  A1 | |  | |
|  | |  | | 02 | |  | |
| 11 | | = | | B1  B1  B1 | | For num  For deno | |
|  | |  | | 02 | |  | |
| 12 | | (x + 3)2 + (-y – 2)2 = 32  x2 + 6x + 9 + y2 + 4y + 4 = 9  x2 + y2 + 6x + 4y + 4 = 0 | | M1  M1  A1 | |  | |
|  | |  | | 03 | |  | |
| 13 | | Wambua:  Amount = 6400  = 6400  = Sh. 9734  Interest = 9734 – 6400  = Sh. 3334  Muinde: Interest  = 12800 = x 3  = Sh. 4800  Muinde’s investment by  (4800 – 3334)  = Sh. 1466 | | B1  B1  A1 | |  | |
|  | |  | |  | |  | |
| 14 | | 1. 1 + + 5 +   1 - -   1. 1 - (0.04) + (0.04)2 - (0.04)3   1 – 0.1 + 0.004 – 0.00008  = 0.90392 | | B1  M1  A1 | | ✓Substitution  CAO | |
|  | |  | | 03 | |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| 15 | x + 60 + x = 180o  2x + 60 = 180  2x = 120  x =  = 60o | M1  A1 | For eqn |
|  |  | 02 |  |
| 16 | Log (x-1) = Log 12 – Log (x – 2)  = Log  x – 1=  (x – 1) (x – 2) = 12  x2 – 3x + 2 = 12  x2 – 3x – 10 = 0  x2 + 2x – 5x – 10 = 0  x(x + 2) – 5(x + 2) = 0  (x – 5) (x + 2) = 0  x – 5 = 0  x = 5  x + 2 = 0  x = -2  Drop the –ve value  x = 5 | M1  M1  A1 | ` |
|  |  | 03 |  |
|  | **SECTION II** |  |  |
| 17 | 1. i) Taxable income   21200 + 12000 + 1100 + 2000  = 36,300  ii) Payee  First = 840/-  Next = 1440/-  Next = 2400/-  Next = 1500/-  Remaining = 90/-  Tax payable 6,270/-  Less personal relief 1,240  Net payee = 5,030/-   1. Net salary   36,300 (5030 + 250 + 120 + 4500 + 1800)  Net salary = 36,300 – 11700  = 24,600/- | M1  A1  B1  B1  B1  M1  A1  M1  M1  A1 | Subtract relief from Tot.Tax. |
|  |  | 10 |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 18 | 1. Prime No 2, 3, 5, 7   Multiple of 3 3, 6, 9 but 3 cannot be selected twice  P(Prime number or multiple of 3)  =   1. i)  |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | 1 | 2 | 3 | 4 | | H | H1 | H2 | H3 | H4 | | T | T 1 | T 2 | T 3 | T 4 |   ii) P (at least 2 and a head)  P(H2 or H3 or H4)  =   1. i) P(B) =   5x = 3x + 18  2x = 18  x = 9  No of members = 9 + 6 = 15  ii) P(W and B) or P(B and W)  = P(W) x )P(B) + P(B) x P(W)  =  = | B1  B1  B1  B1  B1  M1  A1  B1  M1  A1 | Or equivalent  Or equivalent |
|  |  | 10 |  |
| 19 | (a) Let cost of a cow be x  Let cost of a goat be y  3x + 25y = 75000x 2  Both  2x + 33y = 69600 x 3  6x + 50y = 150000  -  6x + 99y = 208800  - 49y = -58800  y = 1200  3 x 30000 = 75000  3x = 45000  x = 15000  Cow = Sh. 15000; Goat = Sh. 1200  (b) SP for cows = x 15000 x 3  = Sh. 63000  SP for goats = x 1200 x 25  = Sh. 45000  Amount received = 63000 + 45000  = Sh. 108000 | B1  M1  A1  M1  A1  M1  M1  A1  M1  A1 |  |
|  |  | 10 |  |
| 20 | (a) From Δ PQT, PQ =  = 105.3m  (b) From Δ PRT, PR =  = 23.63m  QR = PQ – PR = 105.3 – 23.63  QR = 81.67m  (c) Distance = km;  Time = hr  Speed = x  = 21km/hr | M1  A1  M1  A1  M1  A1  B1  B1  M1  A1 |  |
|  |  | 10 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 21 | (a) (i) PQ = PO + OQ  = - p + q or q – p  (ii) OR = OP + PR  = p + (-p + q)  = p + q  (iii) SQ = SO + OQ  = -OP + OQ  = -p +q or q - p  (b) OT = n(p + q)  From DOST  OT = OS + ST  = p + m(p + q)  p + q = p + mq  = -  4n + 9m = 9…………………. (i)  = m, M = ……………....(ii)  + 9 = 9  4n + 6n = 9  10n = 9  n =  M = x = | B1  M1  A1  B1  B1  M1  M1  M1  M1  Both  A1 |  |
|  |  | 10 |  |
| 22 | (a) A = KBn  Log A = Log KBn  = Log k + log KBn  = nlogB + LogK  (b)   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Log | 0.18 | 0.29 | 0.40 | 0.51 | 0.65 | | Log | 0.20 | 0.40 | 0.60 | 0.81 | 1.06 | | M1 A1  B2 |  |
|  | Log A  Log B  0.2  0.4  0.6  0.8  1.0  0.2  0.4  0.6  0.8  X  X  X  X | S1  P1  L1 |  |
|  | (c) Gradient of line = = 0.5465  n = 0.5  Hence Log K = 0.07  K = 100.07 = 1.175  = 1.2 (1 d.p) | M1  A1  B1 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 23 | 1. **Angle CBD (2 mks)**   <CBD = 90 – 42 = 480  Angle sum of a triangle   1. **Angle ODB (2 mks)**   <ODB = 180 – 42  = = 690  Angles of an isosceles triangle   1. **Angle BAD (2 mks)**   <BAD = ½ x 138 = 640  Angle at the centre is twice one at the circumference   1. **Angle ABC (2 mks)**   <ABD = 420  Alternate segment angles   1. **Angle ODA (2 mks)**   <ODA = 360 – (64 + 222)=740 |  |  |
|  |  | 10 mrks |  |
| 24 |  |  |  |

