

MATHEMATICS PAPER 2 - KAPSABET BOYS 2019 TRIAL MOCK EXAMINATION

SECTION I (50Mks)

Attempt ALL Questions from this section

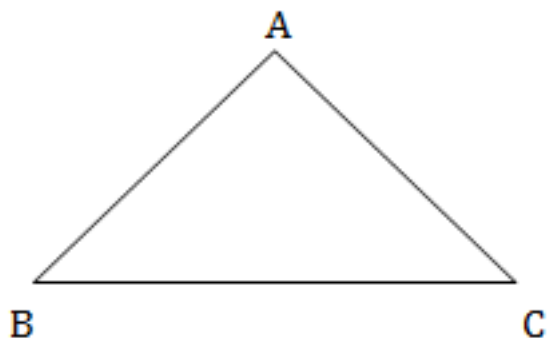
1. Make x the subject of the formula 3mks

$$P = \frac{\sqrt{x + 2w}}{\sqrt{4x + 3R}}$$

2. P varies partly as the square of v and partly as the cube of v. when $V=2$, $P = -20$ and when $v = -3$, $P=135$. Find the relationship between P and v. 3mks
3. Expand $(1 + 2x)^7$ up to x^3 , hence use the expansion to estimate the value of $(1.02)^7$ correct to four decimal places. 3mks
4. Simplify the following by rationalizing the denominator. 3mks

$$\frac{\sqrt{2} - 1}{4\sqrt{2} - 3}$$

5. The diagram below represents a field ABC.



- a. Draw the locus of points equidistant from sides AB and AC 2mks
- b. Draw the locus of points equidistant from points A and C. 2mks
- c. A coin is lost within a region which is nearer to point A than to point C and closer to side AC than to side AB. Shade the region where the coin can be located. 2mks
6. Given $x = 13.4\text{cm}$ and $y=4.3\text{cm}$. calculate the percentage error in x/y correct to 4 d.p.3mks
7. If matrix $A = \begin{pmatrix} 1 & 2 \\ 4 & 3 \end{pmatrix}$ Find B given that $A^2 = (A + B)$. 3mks
8. In the figure below QT is a tangent to a circle at Q. PXRT and QXS are straight lines. $PX = 6\text{cm}$, $RT = 8\text{cm}$, $QX = 4.8\text{cm}$

MARKING SCHEME

1. $p^2 = \frac{x + 2w}{4x + 3R}$ M1
 $4p^2x + 3p^2R = x + 2w$
 $4p^2x - x = 2w - 3p^2R$
 $X(4p^2 - 1) = 2w - 3p^2R$ M1
 $X = \frac{2w - 3p^2R}{4p^2 - 1}$ A1
2. $p = av^2 + bv^3 : 4a + 8b = -20$ M1
 $9a - 27b = 135$
 $36a + 72b = -180$
 $36a - 108b = 540$
 $180b = -720$ M1
 $B = -4$
 $-20 = 4a + 32$
 $4a = -52$
 $a = -13$
 $p = -13V^2 + 4V^3$ A1
3. $(1+2x)^7 = 1 + 7(1)^6(2x)^1 + 21(1)^5 + 35(1)^4(2x)^3$ B1
 $= 1 + 14x + 84x^2 + 280x^3 + \dots$
 $(1.02)^7 = (1 + 0.02)^7 = (1 + 2x)$
 $2x = 0.02 \rightarrow x = 0.01$
Subst $x = 0.01$
 $(1.02)^7 = 1 + 14(0.01) + 84(0.01)^2 + 280(0.01)^3$ M1
 $= 1 + 0.14 + 0.0084 + 0.00028$
 $= 1.14868$
 $= 1.1487$ (to 4d.p) A1
4. $\frac{\sqrt{2}-1}{4\sqrt{2}-3} \times \frac{4\sqrt{2}+3}{4\sqrt{2}+3} = \frac{\sqrt{2}(4\sqrt{2}+3) - 1(4\sqrt{2}+3)}{4\sqrt{2}(4\sqrt{2}+3) - 3(4\sqrt{2}+3)}$ M1
 $= \frac{8 + 3\sqrt{2} - 4\sqrt{2} - 3}{32 + 12\sqrt{2} - 12\sqrt{2} - 9}$
 $= \frac{5 - \sqrt{2}}{23}$ A1
6. Max val of x 13.45 min 35 B1
Max val of Y 4.35 min 4.25
Max vals of x 13.45 = 3.164y
4.25
Min value of x13.35 = 3.069
Y 4.35
Actual value of x13.4 = 3.1163 B1
y 4.3
Absolute error = $\frac{3.1642 - 3.069}{2} = 0.04785$
Percentage error = $0.04785 \times 100 = 1.5355\%$ A1
3.1163
- 7.