NATIONAL 5 MATHEMATICS MODEL PAPER 1

Paper 1

1. $2\frac{5}{6}$
2. $6x^3 - x^2 + 13x - 10$
3. $m = (kL)^2$ or $m = k^2L^2$
4. (a) $2\mathbf{u} + \mathbf{v}$

   (b) $\mathbf{v} - \mathbf{u}$
5. $34°$
6. $\frac{3y}{y+3}$
7. 27
8. (a) $x = 2$

   (b) 9
9. (4, 5)
10. $a = 5$, $b = 4$
11. $\cos B = \frac{3^2 + 6^2 - 5^2}{2 \times 3 \times 6} = \frac{20}{36} = \frac{5}{9}$
12. $6\sqrt{2}$
13. $\frac{7m + 3}{m(m+1)}$
14. discriminant = 24; roots are real since discriminant > 0 and irrational since discriminant is not a perfect squrare.

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Paper 2

1. £684·70
2. (a) mean = 7, standard deviation = 3·96

   (b) Under the new coach, the team scores more points and is more consistent.
3. M(0, 1, 0), N(4, 2, 2)
4. $y = 3x - 1$
5. arc AB = 0·88 metres; this is less than 0·9 metres, so the staircase will not pass the safety regulations.
6. 5400 cm^3
7. £860
8. 18·3 metres
9. 15 cm^2
10. 1503·5 cm^2
11. (a) −3

    (b) 11·5°, 168·5°
12. 0·35 metres
13. (a) $x^2 + 5 = 3(2x)$
    $x^2 + 5 = 6x$
    $x^2 - 6x + 5 = 0$

    (b) 5