

# N5 Senior Prelim Paper 1

$$\textcircled{1} \quad 15x^2 - 6x - 3 \\ = (5x - 3)(3x + 1)$$

②

$$\textcircled{2} \quad (x-2)(4x^2+3x-7) \\ = 4x^3 + 3x^2 - 7x - 8x^2 - 6x + 14 \\ = 4x^3 - 5x^2 - 13x + 14$$

③

$$\textcircled{3} \quad x^2 + 6x + 7 = (x+3)^2 - 3^2 + 7 \\ = (x+3)^2 - 9 + 7 \\ = (x+3)^2 - 2$$

②

$$\textcircled{4} \quad \text{(a) cub } y\text{-axis } x=0 \quad 3y=12 \\ y=4 \quad P(0,4)$$

①

$$\text{(b) } y-b = m(x-a) \\ y-4 = -\frac{1}{2}(x-0) \\ y = -\frac{1}{2}x + 4$$

$$\text{Cub } x\text{-axis } y=0 \\ 0 = -\frac{1}{2}x + 4 \\ \frac{1}{2}x = 4 \\ x = 8 \quad Q(8,0)$$

④

$$\textcircled{5} \quad 5x + \frac{2x-1}{3} = 45 \\ 15x + 2x - 1 = 135 \\ 17x - 1 = 135 \\ 17x = 136 \\ x = 8$$

③

$$\begin{aligned} \text{(b)} \quad a &= \left( \frac{1\frac{1}{6} + \frac{1}{2}}{2} \right)^2 \checkmark \\ &= \left( \frac{1\frac{2}{6} + \frac{3}{6}}{2} \right)^2 \\ &= \left( 1\frac{4}{6} \times \frac{1}{2} \right)^2 \\ &= \left( 1\frac{2}{3} \times \frac{1}{2} \right)^2 \\ &= \left( \frac{5}{3} \times \frac{1}{2} \right)^2 \checkmark \\ &= \left( \frac{5}{6} \right)^2 \checkmark \\ &= \frac{25}{36} \checkmark \end{aligned}$$

(3)

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Total (40)

$$\begin{aligned} \textcircled{6} \quad (a) \quad f(x) &= \frac{6}{\sqrt{x}} \\ f(18) &= \frac{6}{\sqrt{18}} \checkmark \\ &= \frac{6}{3\sqrt{2}} \checkmark \\ &= \frac{2}{\sqrt{2}} \checkmark \\ &= \frac{2\sqrt{2}}{2} \\ &= \sqrt{2} \checkmark \end{aligned}$$

3

$$\begin{aligned} \textcircled{6} \quad (b) \quad \frac{p^5 \times 8p}{2p^3} \\ &= \frac{8p^6}{2p^3} \checkmark \\ &= 4p^3 \checkmark \end{aligned}$$

2

$$\begin{aligned} \textcircled{7} \quad \hat{ACB} &= 90 - 26 \\ &= 64^\circ \checkmark \end{aligned}$$

$$\begin{aligned} \hat{CAB} &= 180 - (64 + 64) \checkmark \\ &= 180 - 128 \\ &= 52^\circ \checkmark \end{aligned}$$

3

$$\begin{aligned} \textcircled{8} \quad \frac{6e^2 - 3e}{4e^2 - 1} \\ &= \frac{3e(2e - 1)}{(2e - 1)(2e + 1)} \checkmark \\ &= \frac{3e}{2e + 1} \checkmark \end{aligned}$$

3

$$\begin{aligned}
 \textcircled{9} \quad \text{angle} &= \frac{4\pi}{\pi r^2} \times 360 \\
 &= \frac{4\pi}{\pi 6^2} \times 360 \\
 &= \frac{4}{36} \times 360 \\
 &= 4 \times 10 \\
 &= 40^\circ
 \end{aligned}$$

④

$$\begin{aligned}
 \textcircled{10} \quad 6x + 3y &= 7 \quad \text{--- (1)} \\
 y &= 2x + 9 \quad \text{--- (2)}
 \end{aligned}$$

Substitute (2) in (1)

$$\begin{aligned}
 6x + 3(2x + 9) &= 7 \\
 6x + 6x + 27 &= 7 \\
 12x &= -20 \\
 x &= -2
 \end{aligned}$$

In (2)

$$\begin{aligned}
 y &= -4 + 9 \\
 &= 5
 \end{aligned}$$

Check in (1)

$$\begin{aligned}
 6x(-2) + 3 \times 5 \\
 = -12 + 15 \\
 = 3
 \end{aligned}$$

Solution  $(-2, 5)$

④

$$\begin{aligned}
 \textcircled{11} \quad (a) \quad T &= 2\sqrt{a} - b \\
 T + b &= 2\sqrt{a} \\
 \frac{T + b}{2} &= \sqrt{a} \\
 a &= \left(\frac{T + b}{2}\right)^2
 \end{aligned}$$

③