

PARALLEL QUESTIONS FROM THE NCEA EXAMINATIONS(2)

It is IMPORTANT to keep all these topics FRESH in your mind.

ALGEBRA

ACHIEVEMENT LEVEL

<p>1a Factorise $6x^2 - 11x - 2$ $(6x + 1)(x - 2)$</p>	<p>1b Solve $6x^2 - 11x - 2 = 0$ $(6x + 1)(x - 2) = 0$ $x = -\frac{1}{6}, 2$</p>
<p>2a Simplify $\frac{(4x^4)^2}{(2x^2)^3}$ $= \frac{16x^8}{8x^6}$ $= 2x^2$</p>	<p>2b Simplify $(8x^{12})^{\frac{2}{3}}$ $= (2x^4)^2$ $= 4x^8$</p>
<p>3a Find x $\text{Log}_x(64) = 6$ $x^6 = 64$ $x = 2$</p>	<p>3b If $T = p\sqrt[3]{ab}$ make b the subject of the equation. $T^2 = p^2 a b$ $\frac{T^2}{p^2 a} = b$</p>

You need 5 out of 6 correct for achieved!

PARALLEL QUESTIONS FROM THE NCEA EXAMINATIONS(3)

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ACHIEVEMENT LEVEL

<p>1a Factorise $6x^2 + x - 2$ $(3x + 2)(2x - 1)$</p>	<p>1b Solve $6x^2 + x - 2 = 0$ $(3x + 2)(2x - 1) = 0$ $x = -\frac{2}{3}, \frac{1}{2}$</p>
<p>2a Simplify $(3x^2)^3 \times (2x^3)^2$ $27x^6 \times 4x^6$ $= 108x^{12}$</p>	<p>2b Simplify $\left(\frac{9a^2}{25b^4}\right)^{-1/2}$ $\left(\frac{25b^4}{9a^2}\right)^{1/2}$ $= \frac{5b^2}{3a}$</p>
<p>3a Find $\log_4(12) = x$ $4^x = 12$ $\log_4 4^x = \log_4 12$ $x \log_4 4 = \log_4 12$ $x = \frac{\log_4 12}{\log_4 4}$ $= 1.79$</p>	<p>3b Make v the subject of the formula: $\sqrt{\frac{a}{b+v}} = p^3$ $\frac{a}{b+v} = p^6$ $\frac{a}{p^6} = b+v$ $\frac{a}{p^6} - b = v$</p>

You need 5 out of 6 correct for achieved!

PARALLEL QUESTIONS FROM THE NCEA EXAMINATIONS(4)

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MERIT LEVEL

<p>1c If the roots of the equation $px^2 + qx + r = 0$ are $x = 7$ and $x = -9$ find p, q and r</p> $(x-7)(x+9) = 0$ $x^2 + 2x - 63 = 0$ $p=1, q=2, r=-63$	<p>1d Solve $x = \log_2(70)$</p> $2^x = 70$ $x \log 2 = \log 70$ $x = \frac{\log 70}{\log 2} = 6.013$
<p>2c If $P = D \times (1.08)^n$ Find n if $P = 4D$</p> $4D = D \times (1.08)^n$ $4 = (1.08)^n$ $\log 4 = n \log (1.08)$ $\frac{\log 4}{\log 1.08} = n$ $n = 18.01$	<p>2d Combine into one fraction:</p> $\frac{4}{3x-5} + \frac{6}{2x-1}$ $\frac{4(2x-1)}{(3x-5)(2x-1)} + \frac{6(3x-5)}{(2x-1)(3x-5)}$ $= \frac{8x-8 + 18x-30}{() ()}$ $= \frac{26x-38}{(3x-5)(2x-1)}$
<p>3c Solve for x</p> $2^x \times 3^x = 40$ $\log 2^x \cdot 3^x = \log 40$ $\log 2^x + \log 3^x = \log 40$ $x \log 2 + x \log 3 = \log 40$ $x(\log 2 + \log 3) = \log 40$ $x = \frac{\log 40}{\log 2 + \log 3} = 2.06$	<p>3d Solve the equation:</p> $\frac{1}{x+1} + \frac{1}{x+2} = \frac{5}{6}$ $x+2 + x+1 = \frac{5}{6} (x+1)(x+2)$ $2x+3 = \frac{5}{6} (x^2+3x+2)$ $12x+18 = 5x^2+15x+10$ $0 = 5x^2+3x-8$ $0 = (5x+8)(x-1)$ $x = -\frac{8}{5} \text{ or } 1$


You need 1 merit question correct in each of the questions 1, 2 and 3.

PARALLEL QUESTIONS FROM THE NCEA EXAMINATIONS(5)

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ALGEBRA

MERIT LEVEL to Excellence Level.

<p>1c If the roots of the equation $ax^2 + bx + c = 0$ are $x = \frac{2}{3}$ and $x = -\frac{3}{4}$ find a, b and c as integers.</p> <p>$(x - \frac{2}{3})(x + \frac{3}{4}) = 0$ but better to put $(3x - 2)(4x + 3) = 0$ $12x^2 + x - 6 = 0$ $a = 12, b = 1, c = -6$</p>	<p>1d The length of a room is 3 m longer than the width and its area is 108 m^2. Form an equation and solve it to find the width and length of the room.</p>  <p>$x(x+3) = 108$ $x^2 + 3x - 108 = 0$ $(x-9)(x+12) = 0$ $x = 9, -12$ <i>-12 is not valid</i></p>
<p>2c Solve $(x^2 - 5)^2 = 16$</p> <p>$x^2 - 5 = \pm \sqrt{16}$ $x^2 - 5 = 4$ or $x^2 - 5 = -4$ $x^2 = 9$ $x^2 = 1$ $x = \pm 3$ $x = \pm 1$</p>	<p>2d Combine into one fraction:</p> $\frac{7}{x-6} - \frac{6}{x-4}$ $\frac{7(x-4)}{(x)(x)} - \frac{6(x-6)}{(x)(x)}$ $= \frac{7x-28 - 6x+36}{(x)(x)}$ $= \frac{x+8}{(x-6)(x-4)}$
<p>3c Solve $(x^2 - 4)^2 = (x + 2)^2$</p> <p>$x^2 - 4 = \pm (x + 2)$ $x^2 - 4 = x + 2$ or $x^2 - 4 = -x - 2$ $x^2 - x - 6 = 0$ or $x^2 + x - 2 = 0$ $(x-3)(x+2) = 0$ $(x+2)(x-1) = 0$ $x = 3, -2$ $x = -2, 1$ $x = 3, 1, -2$</p>	<p>3d Find the range of values of p so that $x^2 + (p-1)x + p + 2 = 0$ has</p> <p>(i) 1 real solution. (ii) no real solutions. (iii) 2 real solutions</p> <p>$\Delta = (p-1)^2 - 4(p+2)$ $= p^2 - 2p + 1 - 4p - 8$ $= p^2 - 6p - 7$ $= (p-7)(p+1)$</p> <p>(i) $p = 7$ or -1 (ii) $-1 < p < 7$ (iii) $p < -1$ or $p > 7$</p>

You need 1 merit question correct in each of the questions 1, 2 and 3.