

# Maths O Final test

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1) yes

2)  $(x-1)(x-1)$

$(x^2-2x+1)(x^2-2x+1) \quad \times 4$

$$x^4 - 2x^3 + x^2 - 2x^3 + 4x^2 - 2x - x^2 - 2x + 1$$

$$x^4 - 4x^3 + 4x^2 - 4x + 1 \quad (x-1)$$

$$x^5 - x^4 - 4x^4 - 4x^3 + 4x^3 - 4x^2 - 4x^2 + 4x + x - 1$$

$$x^5 - 5x^4 - 8x^2 + 5x - 1$$

3)  $3x^2 + x$

$$x^2 \sqrt{x^2+1} \stackrel{=0}{=} x$$

$$3x^2 + x = 0$$

$$x = \frac{1}{3}$$

$$x = 0$$



$$4) \frac{3x^2 + x}{x^3 \sqrt{x^6 + 1}} > 0$$

$$x > \frac{1}{3}$$

$$5) \frac{x^3 - 7x^2 + 7x + 15}{x^2 - 1} = 0$$

$$\cancel{(x-1)}(x+5)(x+3) = 0$$

$$\cancel{(x-1)}(x+1)$$

$$\frac{(x+5)(x+3)}{(x+1)} = 0$$

$$x = -5$$

$$x = -3$$

$$6) \frac{x^3 - 7x^2 + 7x + 15}{x^2 - 1} = 0$$

$$\frac{(x+5)(x+3)}{(x+1)} > 0$$



$$\Rightarrow \frac{a^6 - b^6}{a^3 + b^3}$$

$$a^3 + b^3 (\cancel{a^2 + ab + b^2})$$

$$a + b (\cancel{a^2 + ab + b^2})$$

$$\frac{a^3 + b^3}{\cancel{a + b}} = (\cancel{a + b})(a - b)$$

Final answer -  $(a - b)$

$$\begin{array}{r} 8) 3 \overline{) 714} \quad 2145 \\ \underline{238} \quad 715 \end{array}$$

3 is the greatest common factor

$$9) \frac{x^8 - 3x^6 + x^2 - 1}{x^4 - x^2 - 1}$$



$$10) 2x^2 - x - 1$$

$$\rightarrow 2x^2 - 2x - x - 1$$

$$2x(x-1) + 1(x-1)$$

$$= (x-1)(2x+1)$$

$$\hookrightarrow x^2 + 8x + 3$$

$$\hookrightarrow x^2 + 2x + 6x + 3$$

$$2x^2 = (2x+1) + 3(2x+1)$$

$$= (2x+1)(2x+3)$$

$$\text{answer} \rightarrow (2x+1)$$

$$11) -3x^2 - 3x + 1 \neq 0$$

$$12) x^2 + x + 4$$



$$(x-h)^2 (y-k)^2$$

$$(h, k) \quad r^2$$

$$13) x^2 + y^2 + 2x + 2y + 1 = 0$$

$$x^2 + 2x + y^2 + 2y + 1 =$$

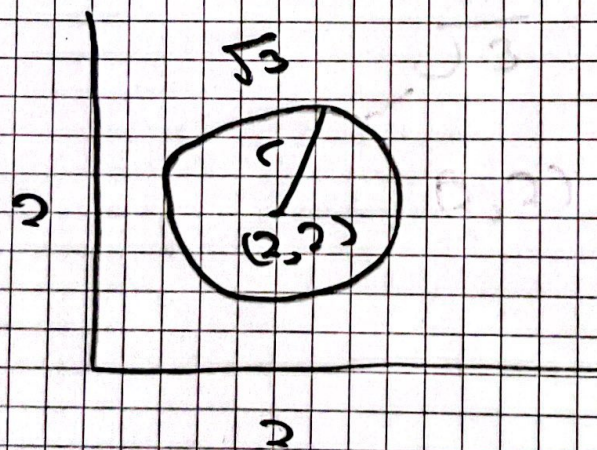
$$\left(\frac{2}{2}\right)^2 = 1 \quad \left(\frac{2}{2}\right)^2 = 1 \quad 1$$

$$x^2 + 2x + 1 \quad y^2 + 2y + 1 = 3$$

$$(x+1)^2 \quad (y+1)^2 \quad 1+1+1=3$$

$$\text{center} = (-1, -1)$$

$$\text{radius} = \sqrt{3}$$



$$14) f(x) = x^2 - 2x$$

$$f(2)$$

$$2^2 - 2(2) = 0$$

$$f^{-1}(1)$$

$$x^2 - 2x$$

$$\frac{2}{1} + 2 = 4$$



$$15) \frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} = \frac{9 + 2\sqrt{35}}{5}$$