

Show that, if $x^2 + x + b = 0$ and $x^2 + (b - 1)^2 = (a - 1)(b - ab)$.

If the equations $x^2 + ax + b = 0$ and $x^2 + 2x + 3 = 0$ have a common root

$$b = \frac{5a^2(c-2)}{(c+3)^2}$$

Find the condition for the equations $x^2 + 2x + 3 = 0$ and $x^2 + ax + b = 0$ to have a common root.

$$2 + x + 0 = dx$$

$$3. \quad x^2 + 2x + 3 = 0 \quad \text{and} \quad bx + 3 = 0 \quad \text{have a common root}$$

or

$$2 + x + 0 = dx$$

$$(i) \quad 2 - 5c^2 + 5c^{2a} = 0.$$

$$(ii) \quad x^2 + 2x = 3 + \frac{35}{x^2 + 2x}$$

$$(iii) \quad \frac{x^2 + 16x^2}{2x^2 - 9x^2 + 14x^2 - 9x + 2} = 17.$$

$$(iv) \quad 4x^2 + 25y^2 = 100, xy = 4$$

$$(v) \quad 9x^2 + 4x^2 = 37$$

$$(vi) \quad \frac{1}{x-2} + \frac{1}{x+3} = \frac{1}{k+3}$$

$$(vii) \quad \sqrt{2-x} + \sqrt{3+x} = 3.$$

Use row reduction to solve the simultaneous equations $2x + 3y + 4z = 8, 3x - 2y - 3z = -2,$

$+ ax + b = 0$ have a common root then

5,

$$| 2 \cdot 3 \cdot 2.5 + 4 + 2 \cdot 3.$$

$$2 + 3 \cdot + 4 \cdot 8 | 2 \cdot , 3, 2 + 4 + 2 \cdot 3,$$

$$7. \quad \text{When the numbers } 3x^2 + 2x + 5 \text{ and } 3x^2 + 2x + 5 \text{ are equal,}$$

$$3x^2 + 2x + 5 = 0.$$

$$8. \quad \text{When the numbers } 3x^2 + 2x + 5 \text{ and } 3x^2 + 2x + 5 \text{ are equal,}$$

$$3x^2 + 2x + 5 = 0.$$

5. provethatheremainderwhen $3d(x-ays)(x,)$

(a) + Aa). Hence given

$$| \text{ If } \text{er} 0 \text{ uaoo} \text{K} \text{—} 5\text{x} + \text{qx} | 8 \text{ 02 m} | \text{G} \text{P} \text{—} |$$

"10.

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$$, \text{c} | \text{d}$$

$$+ \text{C} + \text{d}$$

$$| \text{a} + \text{mb} +$$

$$2 \quad 2$$

$$, \text{x} + |$$

$$\text{x}$$

3 |

Find the value of for which the polynomial $x^2 + 3x + p$

$$x^2 + 5x - 10 \text{ has } + 2, 3, 5, 20,$$

6

Show on an Argand diagram the locus of z when

(a) $|z - 1 - i| = 2$

(b) $\operatorname{Re} z = 1$ and $-\frac{\pi}{2} \leq \arg z \leq \frac{\pi}{2}$. In each case find the least value of $|z|$.

Find the least value of $|z|$.

$|z - 1 - i| = 2$

Solve $3 \tan^2 x - 2 \tan x = 1$ for $0 \leq x \leq \pi$.
Prove that $\cos^2 x = \frac{10 \sin x \cos x + 12 \cos 2x}{\cos 5x + 5 \cos 3x + 10 \cos x}$.

Express $10 \sin x \cos x + 12 \cos 2x$ in the form $R \sin(2x + \alpha)$. Hence solve the equation $10 \sin x \cos x + 12 \cos 2x = 7$ for $0^\circ \leq x \leq 360^\circ$.

7. Find the area enclosed by the curves $y^2 = 4x$ and $x^2 = 4y$.
8. Find the equation of the tangent to the curve $y = 2 - 4x^2 + x^4$. What are the coordinates of the point where the tangent meets the curve again? Find the equation of the tangent at this point.

9. If $y = \tan\left(2 \tan^{-1} \frac{x}{2}\right)$, show that $\frac{dy}{dx} = \frac{4(1+y^2)}{4+x^2}$.

10. Differentiate $\sqrt{\cos x}$ from first principles.

11. A particle is moving on a straight line such that its distance from a fixed point O , t seconds after motion begins is $s = \cos t + \cos 2t$. Find
(i) The time when the particle passes through O .
(ii) The velocity of the particle at this instant.
(iii) The acceleration when the velocity is zero.

the roots of the eq...

6. If $a = x \cos \theta + y \sin \theta$ and $b = x \sin \theta - y \cos \theta$, prove that $\tan \theta = \frac{a^2 - b^2}{2ab}$.