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FA-3 MATHS

Q1.

01 The Quadratic polynomial whose sum and product of zeros are 4 and 5 respectively

a) $P(x) = x^2 - 4x - 5$ c) $P(x) = x^2 - 5x + 4$
b) $P(x) = x^2 + 4x - 5$ d) $P(x) = x^2 - 4x + 5$

02 If $\sin A = \frac{1}{\sqrt{2}}$, the magnitude of $\angle A$ is

a) $90°$ b) $60°$ c) $80°$ $\boxed{d)\ 45°}$

03 If the roots of the QE $x^2 + 6x + k = 0$ are equal the the value of "k" is

$\boxed{a)\ 9}$ b) -9 c) 8 d) 15

04 The value of $\cos 48° - \sin 42°$ is

$\boxed{a)\ 0}$ b) $\frac{1}{4}$ c) $\frac{1}{2}$ d) 1

05 The standard form of $2x^2 = x - 7$ is

a) $2x^2 - x = -7$ $\boxed{c)\ 2x^2 - x + 7 = 0}$
b) $2x^2 = x - 7 = 0$ d) $2x^2 + 7 + 7 = 0$

Q2

01 write the standard form of a Quadratic equation

$\rightarrow ax^2 + bx + c = 0$

02 If $\cos\theta = \frac{24}{25}$ then write the value of $\sec\theta$

$\rightarrow \sec\theta = \frac{1}{\cos\theta} = \frac{1}{\frac{24}{25}} = \frac{25}{24}$

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03 write the degree of the polynomial $p(x) = x^2 + 2x^3 + 5x^4 + 6$

$\rightarrow$ 4

04 Find the roots of the quadratic equation $x^2 + 7x + 12$, $x^2 + 4x + 4$

$\rightarrow$

05 $\sin(90-\theta)$ is equal to

$\boxed{\text{a) } \cos\theta}$ b) $\tan\theta$ c) $\sec\theta$ d) $\cot\theta$

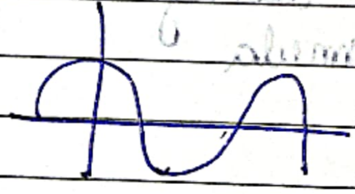
06 If $13 \sin\theta = 12$, then (find) the value of ~~sec~~ $\operatorname{cosec}\theta$ is

a) $\frac{12}{5}$ b) $\frac{13}{5}$ c) $\frac{12}{13}$ $\boxed{\text{d) } \frac{13}{12}}$

07 value of $\cot 90°$ is

a) $\frac{1}{\sqrt{2}}$ b) 1 c) $\sqrt{3}$ $\boxed{\text{d) } 0}$

08 In the given graph the number of zeroes of the polynomial $y = P(x)$ is



$\longrightarrow$ The number of zeroes is 4 because as the graph intersect the axis at four points.

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Q2

1) find the value of the discriminent of the equation $4x^2-12x+9=0$ and Hence write the nature of the roots

→ $4x^2-12x+9=0$

$ax^2+bx+c=0$

$a=4$ $b=-12$ $c=9$

Discriminent = b^2-4ac

$\Delta = (-12)^2 - 4(4)(9)$

$\Delta = 144 - 16(9)$

$\Delta = 144 - 144$

$\Delta = 0$ ∴ The nature of the root is real and equal

$= \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{-(-12) \pm \sqrt{0}}{2(4)}$

$= \frac{\cancel{12}^{3} \pm \sqrt{0}}{\cancel{8}2}$

$= \frac{3+\sqrt{0}}{2}$ or $= \frac{3-\sqrt{0}}{2}$

$\boxed{= \frac{3\sqrt{0}}{2}}$ or $\boxed{= \frac{3-\sqrt{0}}{2}}$

Q2 find the roots of the Quadratic equation $x^2+4x+5=0$ using the Quadratic formula

→ $x^2+4x+5=0$

$ax^2+bx+c=0$

$a=1$ $b=4$ $c=5$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

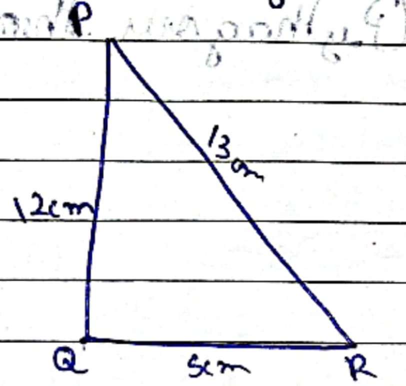
$$x = \frac{-4 \pm \sqrt{(4)^2 - (4)(1)(5)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{16 - 20}}{2}$$

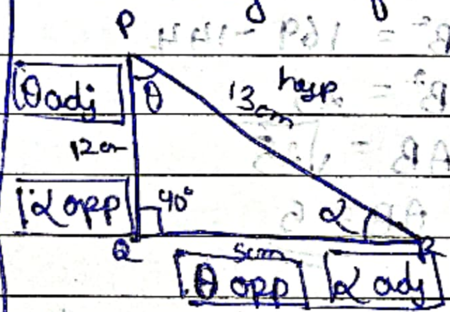
$$x = \frac{-\cancel{4}^{2} \pm \sqrt{-4}}{\cancel{2}_{1}}$$

$$\boxed{x = -2 + \sqrt{-4}} \quad \text{or} \quad \boxed{x = -2 - \sqrt{-4}}$$

03 In the figure given below find the value of ~~cos~~ $\sin\theta$ & $\cos\alpha$.



For My Refrence



→ We know that,

$$\sin\theta = \frac{opp}{hyp} \qquad \cos\theta = \frac{adj}{hyp}$$

$$\sin\theta = \frac{QR}{PR} \qquad \cos\theta = \frac{QR}{PR}$$

$$\sin\theta = \frac{5}{13} \qquad \cos\theta = \frac{5}{13}$$

∴ The values of $\sin\theta$ & $\cos\theta$ are same, $\frac{5}{13}$ & $\frac{5}{13}$

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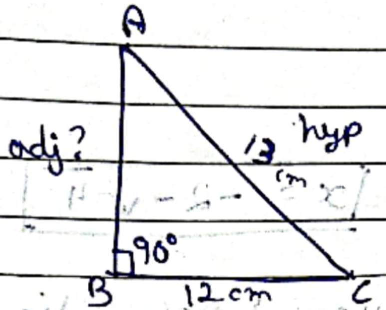
Q4 If $\sin\theta, \frac{12}{13}$ find the value of $\cos\theta$ & $\tan\theta$

→ We know that $\sin\theta = \frac{opp}{hyp}$



In this $\triangle ABC$ $\angle B = 90°$

$AC^2 = AB^2 + BC^2$ ⟶ (Pythagoras theorem)

$13^2 = AB^2 + 12^2$

$169 = AB^2 + 144$

$AB^2 = 169 - 144$

$AB^2 = 25$

$AB = \sqrt{25}$

$AB = 5$

Now, we know that : $\cos\theta = \frac{adj}{hyp}$ ⟵ $\tan\theta = \frac{opp}{adj}$

$\cos\theta = \frac{5}{13}$ // $\tan\theta = \frac{12}{5}$ //

Q3. find the quotient and the reminder when $p(x) = x^2 - 3x^2 + 5x - 3$ is divided by $g(x)$ $x^2 - 2$

⟶ $p(x) = x^2 - 3x^2 + 5x - 3$

$g(x) = x^2 - 2$

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$$\begin{array}{r|l} & x-3 \\ \hline x^2-2 & \cancel{x^3}-3x^2+5x-3 \\ & \cancel{x^3}+0x^2-2x \\ \hline & -\cancel{3x^2}+7x-3 \\ & -\cancel{3x^2}+0x+6 \\ \hline & 7x-9 \end{array}$$

$\therefore$ quatient $= \boxed{x-3}$ & Reminder $= \boxed{7x-9}$

Q2 find two number's whose sum is 27 and product is 182

Let those number's whose sum $= 27$

be 1st number be "x" 2nd number be $(27-x)$

Product of $x(27-x) = 182$

$x(27-x) = 182$

$= 27x - x^2 = 182$

$x^2 - 27x - 182 = 0$

$x^2 - 13x - 14x - 182 = 0$

$x(x-13) - 14(x-13)$

$(x-13)(x-14)$

$x - 13 = 0$ | $x - 14 = 0$

$\boxed{x = 13}$ | $\boxed{x = 14}$

or | or

$\boxed{x = -13}$ | $\boxed{x = -14}$

27: -13, -14

$\therefore$ The two numbers whose sum is 27 and product is -182 are 13, 14 or 14, 13

Q3 find the zeros of the Quadratic polynomial and verify the relation between the zeros & coeffient

(Questions Nai Heen isliye sirf Method ~~....~~ Dekhliyo)

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$4s^2 - 4s + 1$

$\rightarrow 4s^2 - 4s + 1$

$4s^2 - 2s - 2s + 1$

$2s(2s-1) - 1(2s-1)$

$(2s-1)(2s-1)$

-4 → -2, -2

$a = 4 \quad b = -4 \quad c = 1$

$2s - 1 = 0$ | $2s - 1 = 0$

$\boxed{s = \frac{1}{2}}$ | $\boxed{s = \frac{1}{2}}$

LHS = RHS

The zeroes of the quadratic polynomial are $\frac{1}{2}, \frac{1}{2}$.

Sum of zeroes $= \alpha + \beta = \frac{1}{2} + \frac{1}{2} = \frac{1}{4}$

Product of zeroes $= \alpha\beta = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

$\frac{\text{Co-efficent term}}{\text{co-efficent of } s} = \frac{-b}{a} = \frac{-(-4)1}{41} = \frac{1}{1}$

$\frac{\text{Constant term}}{\text{Coefficent of } s} = \frac{c}{a} = \frac{1}{4}$

$\alpha + \beta = \frac{-b}{a}$ | $\alpha\beta = \frac{c}{a}$

$\frac{1}{4} = \frac{1}{4}$ | $\frac{1}{4} = \frac{1}{4}$

LHS = RHS | LHS = RHS

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03 $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2$
$= 7 + \tan + \cos^2 A$

Or

$$\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$$

$\longrightarrow$ $\text{LHS} = \sqrt{\dfrac{1+\sin A}{1-\sin A}}$

$= \sqrt{\dfrac{1+\sin A}{1-\sin A} \times \dfrac{1+\sin A}{1+\sin A}}$

$= \sqrt{\dfrac{(1+\sin A)^2}{1-\sin^2 A}}$

$= \sqrt{\dfrac{(1+\sin A)^2}{\cos^2 A}}$

$= \dfrac{\sqrt{(1+\sin A)^2}}{\sqrt{\cos^2 A}}$

$= \dfrac{1+\sin A}{\cos A}$

$= \dfrac{1}{\cos A} + \dfrac{\sin A}{\cos A}$

$= \underline{\underline{\sec A}} + \underline{\underline{\tan A}}$

$\underline{\underline{\text{LHS} = \text{RHS}}}$