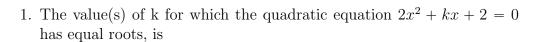
ALGEBRA

December 11, 2023



- (A) 4
- (B) ± 4
- (C) -4
- (D) 0

2. on dividing a polynomial p(x) by $x^2 - 4$, quotient and remainder are found to be x and 3 respectively. The polynomial p(x) is

- (A) $3x^2 + x 12$
- (B) $x^3 4x + 3$
- (C) $x^2 + 3x 4$
- (D) $x^3 4x 3$

3. Simplest form of

$$\frac{1 + \tan^{2A}}{1 + \cot^{2A}}$$

is .

4. Write the value of

$$\sin^2 30^\circ + \cos^2 60^\circ$$

.

- 5. From the quadratic polynomial, the sum and product of whose zeroes are (-3) and 2 respectively.
- 6. If A, B and C are interior angles of $\triangle ABC$, then show that

$$\cos\left(\frac{B+C}{2}\right) = \sin\left(\frac{A}{2}\right)$$

7. Prove that:

$$(\sin^4 \theta - \cos^4 \theta + 1) cosec^2 \theta = 2$$

- 8. Sum of the areas of two squares is $544m^2$. If the difference of their perimeters is 32m, find the sides of the two squares.
- 9. A motor boat whose speed is 18Km/h in still water takes 1 hour more to go 24Km upstream than to return down stream to the same spot. Find the speed of the stream.
- 10. Obtain the zeroes of the polynomial $p(x) = 2x^4 x^3 11x^2 + 5x + 5$ if two zeroes are $\sqrt{5}$ and $-\sqrt{5}$.
- 11. What minimum is added to $2x^3 3x^2 + 6x + 7$ so that the resulting polynomial will be divisible by $x^2 4x + 8$?
- 12. If $\cos\left(\sin^{-1}\frac{2}{\sqrt{5}} + \cos^{-1}x\right) = 0$, then x is equal to
 - (A) $\frac{1}{\sqrt{5}}$
 - (B) $-\frac{2}{\sqrt{5}}$
 - (C) $\frac{2}{\sqrt{5}}$
 - (D) 1