

Half Term Test – Practise Paper

1. Factorise using completing the square (a) $x^2 - 6x - 4$ (b) $x^2 + 3x + 5$
2. Solve using completing the square $2x^2 - 8x + 7 = 0$
3. Find the co-ordinates of the points at which the line with equation $x + y = 9$ intersects the curve with equation $x^2 - 3xy + 2y^2 = 0$.
4. Simplify $81^{\frac{1}{2}} \times 27^{\frac{2}{3}}$
5. Given that $f(x) = x^2 - 3x - 10$ and $g(x) = 2x - 1$. Find
 - a. $f(0)$
 - b. $g(5)$
 - c. x if $g(x) = 9$
 - d. $gf(x)$ in its simplest terms
 - e. $f(x) = 0$
6. Draw a sketch of the graph of $y = f(x)$ when $f(x) = x^2$. On the same graph sketch the curves $y = f(x - 3)$ and $y = -f(x - 3)$
7. Draw a sketch of the graph of $y = f(x)$ where $f(x) = \sin x$, for $0 \leq x \leq 360$. On the same graph sketch the curve $y = f(2x)$.
8. Use the factor theorem to solve the equation $x^3 + 2x^2 - 9x - 18 = 0$
9. When the function $f(x) = 2x^3 + px^2 + qx + 6$ is divided by $x + 1$ the remainder is 12. When divided by $x - 1$ the remainder is -6 .
 - a. Find the values of p and q .
 - b. Show that $f(1/2) = 0$ and hence write $f(x)$ as the product of three linear factors.

10. The four points A, B, C and D lie on the circumference of the circle centre O . The tangent PQ touches the circle at A .

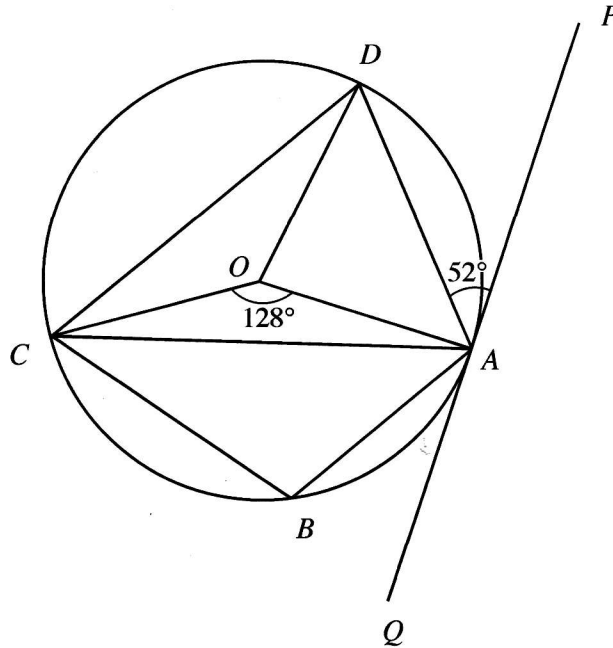


Diagram not drawn to scale.

Given that $\widehat{COA} = 128^\circ$ and $\widehat{DAP} = 52^\circ$ find the size of **each** of the following angles. Give reasons for your answers.

(a) \widehat{CBA}

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(b) \widehat{DOA}

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