

Year 12 Zonal 2026

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Y12/2. A radio is sold for \$990, **inclusive** of 12.5% VAT. Find the amount of VAT charged.

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Y12/3 A car travels **100 km** at **50 km/h** and another **200 km** at **100 km/h**. Find the average speed.

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Y12/4. A sum of **\$5000** accumulates to **\$6050** in **2 years** with interest compounded annually.

Find the **compound interest rate per year**.

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Y12/5. Evaluate $\log 1 + \log 0.1 + \log 1000$

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Y12/6 A group of people attend a meeting. Each person shakes hands once with every other person. If the total number of handshakes is 378, find the number of people at the meeting.

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Y12/7. Given that it is 5 o'clock, exactly how long, in minutes, will it take for the minute hand to catch up with the hour hand?

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Y12/8 A container has **15 litres** of a solution containing **40% alcohol**. Some litres of this solution are removed and replaced with pure alcohol. The final solution contains **70% alcohol**. Find the amount removed and replaced.

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Y12/9. A group of **10 members** must be divided into **2 equal teams of 5 members each**. How many different ways can the teams be formed?

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Y12/10. A boat travels 36 km downstream and 24 km upstream in a total time of 6 hours. The speed of the boat in still water is 10 km/h. Find the speed of the river current.

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Y12/11. In a survey of 80 students, students were asked if they play soccer, basketball, or tennis.

- 45 students play soccer.
- 12 students play both soccer and basketball.
- 8 students play both soccer and tennis.
- 3 students play all three sports.

What percentage of students like only soccer?

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Y12/12 Find the area enclosed by the curve $y = (x - 6)^2$, the y -axis and the x -axis.

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Y12/13. A can complete a task in **16 days**, B in **24 days**, and C in **12 days**.
They all work together for **2 days**, after which C leaves.
Find the total number of days taken to complete the task.

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Y12/14 The wheels of a car travelling at **72 km/h** make **5 revolutions per second**.

Calculate the **diameter of the wheel in metres in terms of π** .

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Y12/15. Calculate the value of k if $x - 2$ is a factor of $f(x) = x^3 + 8x^2 + 7x + k$

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Y12/16. Determine the values of k for which the equation $2x^2 + kx + 8 = 0$ has no real roots.

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Y12/17. A cinema sold **120 tickets**. Adult tickets cost **\$12** and child tickets cost **\$6**. The total money collected was **\$1080**.

Find the number of adult tickets sold.

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Y12/18. A **7** is written at the right-hand end of a **three-digit number**. Its value increases by **5317**. Find the original number.

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Y12/19. Find the coordinates of the turning point of $y = -x^2 + 4x - 3$.

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Y12/20. Find all values of k such that the horizontal line $y = k$ intersects the graph of the function $y = -x^3 + 12x - 3$ at only **one** point.

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