

Year 10 Zonal 2026

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Y10/2. If $a * b = (a^2 - \sqrt{b})^{-1}$ find the value of $-\frac{1}{2} * 1\frac{7}{9}$

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Y10/3 Factorise $x^2 + x - 90$

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Y10/4. The cash price of a laptop was \$4300. Tevita bought the laptop on the following hire purchase terms

- \$300 deposit.
- \$200 per month for 24 months

Determine the **rate** of simple interest charged per annum. **Express your answer as a percentage.**

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Y10/5 What is the range of $3x^2 + 3y^2 = 243$?

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Y10/6. Find the radius of a circle if a central angle of 50° intercepts an arc of length 7.5π cm.

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How much interest will he get after 4 years?

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Y10/8 A shopkeeper makes a profit of \$18 after selling an item for \$63. Determine the **percentage profit**.

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Y10/9 Solve $\frac{x-2}{5} = \frac{20}{x-2}$

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Y10/10. Simplify $\sqrt{16^{2x+2}} + 4^x \times 4^{x+2}$

Express your answer in base 2

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Y10/11. A box made from a **20 cm × 20 cm** square by cutting a square of sides 2 cm from each corner and bending up the sides.

Another box is made from the same-sized cardboard but with **3 cm** corner cuts.

Find the difference in volume between the two boxes.

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Y10/12. A hemisphere with radius **3 cm** has the same volume as a cylinder with radius **3 cm**.

Find the height of the cylinder.

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Y10/13 In a survey, 200 students were asked if they like basketball and tennis.

- 94 students like only tennis.
- 15 students like neither basketball nor tennis.
- 20 students like both basketball and tennis.

What percentage of the 200 students like basketball?

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Y10/14. A security system uses a coin toss and a die roll to generate a code. The code is accepted if the coin shows **Head** and the die shows a number **less than 5**. What is the probability that the code is accepted? Give your answer in simplified form.

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Y10/16. Simplify $25 - (2x - 5)^2 + x^2$.

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Y10/17. A shop increases the price of an item by 60%. To return the item to its original price, the new price must be reduced by what percentage?

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Y10/18 Two towns **A and B are 300 km apart**. A car leaves town A at **8:00 am** travelling at **60 km/h**. Another car leaves town B at **9:00 am** travelling towards A at **90 km/h**.
At what time will they meet?

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Y10/19. 7 people sit around a circular table. Alice, Bob, and Charlie must not sit together. How many arrangements are possible?

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Y10/20 Find the curved surface area of a cone of radius 7 cm and height 24 cm.

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