

Year 10 Zonal 2025

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

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Y10/2. Factorise $x^2 + 2x - 15$

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Y10/3 The **cash price** of a laptop is \$2500. Tevita wants to buy the laptop on a **hire purchase** agreement. The conditions of the agreement are:

- 20% **deposit**.
- 10% per annum **simple interest**.
- 24 equal **monthly** payments.

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Y10/6. Simplify $\sqrt{4^{2x}} + 2^x \times 2^x$

Express your answer in base 2

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Y10/7. An open box is made from a square piece of cardboard with sides 20 cm by cutting a square of sides 2 cm from each corner and bending up the sides.

Find the volume of the open box.

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Y10/8. The volume of a sphere of radius 8 cm is equal to the volume of a right square based pyramid, with a base side length of 32. What is the height of the pyramid in terms of π ?

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Y10/9. In a survey, 100 students were asked if they like soccer and were also asked if they like rugby. A total of 68 students like soccer. A total of 53 like rugby. A total of 6 like neither soccer nor rugby.

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Y10/11. If $f(x) = 2x - 1$, find $f^{-1}(9)$

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Y10/12. What is the range of $2x^2 + 2y^2 = 50$?

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Y10/13. Solve $3^{5-x} = 9^{4-3x}$.

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Y10/14. Solve $(5 - x)^2 - 8 = 1$

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Y10/15. Three coins are tossed simultaneously. Determine the probability of getting at least one tail.

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Y10/17. Simplify $-30x - (3x - 5)^2$.

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Y0/18. What is the gradient of the line $3y - 6x = 5$?

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Y10/19. A circular pool with a radius of 10m has a circular walkway constructed around it with a width of 1m. Find the area, in m^2 , of the walkway in terms of π .

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Y10/20. In how many different ways can 6 people sit around a circular dinner table?

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