

Year 11 Finals 2023

1. In a shop, 10% discount is offered on all marked prices. Manoa **saves** \$20 on a pair of jeans. How much does he pay for the jeans?

2. 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:

- \$500 **deposit**;
- 16% per annum **simple interest**;
- 24 equal **monthly** payments.

Determine the **monthly** payments.

3. The mean of four positive integers is 5. The median of the four integers is 6. What is the sum of the largest and smallest of the integers?

4. The price of a calculator increased by 5% and then decreased by 20% . It was now \$8 less expensive than its original price. What was the original price of calculator?

5. If there are six different pairs of socks in the drawer, what is the smallest number you could reach in and grab (without looking) to guarantee you have a matching pair? .

6. Evaluate $1 - 2 + 3 - 4 + \cdots - 98 + 99$

7. A circle with a center at $(6, 5)$ is tangent to a line at the point $(2, 7)$. Find the equation of the line tangent to the circle in the form $y = mx + c$.

8. Find the sum of the values a and b satisfying the equation $\begin{pmatrix} 3 & 1 \\ 0 & -2 \end{pmatrix} \begin{pmatrix} a \\ b \end{pmatrix} = \begin{pmatrix} 3 \\ 6 \end{pmatrix}$

9. If the radius of a circle is decreased by 10%, by what percent has the area of the circle decreased?

10. An isosceles triangle has two sides of length 10 and one of length 12. What is its area?

11. Calculate the value of $\sum_{n=1}^{50} (2n - 1)$

12. A rectangular box measures 30 cm by 40 cm by 120 cm. What is the length of the longest pole in centimetres that can fit in the box?

13. Mangoes contain 99% water. There are 100 kg of fresh cut mangoes. After a few hours in the sun, some water evaporates and the percentage of water in the mangoes becomes 90%. What is the new weight, in kg, of the mangoes?

14. What is the size of the acute angle between the hour and minute hands of a clock at 2:15?

15. A non-vertical line p intersects the parabola $y = x^2 - 6x + 3$ at only the point $(4, -5)$. The y -intercept of line p is $(0, k)$. Find the value of k .

16. On Vakale island, 99% of the population are natives. Some natives emigrate so that only 98% of the population are natives. If the initial population of Vakale was 1000, how many natives emigrated?

17. A property owner sold two houses at \$96 000. The profit on one was 20% and on the other he made a loss of 20%. Taking the two sales together, the property owner made a loss. How much was the loss?

18. Tina was given a large pack of sweets. She gave one sixth of the sweets to Jane. Tina then gave one thirteenth of the remaining sweets to Jasinta. Tina was left with 60 sweets. How many sweets did Tina initially have?

19. Given that it is 3 o'clock, exactly how long, in minutes, will it take for the minute hand to catch up with the hour hand?

20. The first and fifth terms of an arithmetic sequence are -3 and 17 , respectively. Find the 50th term.
