

1. Lal's normally works 8 hours a day. He is paid \$10 per hour. All overtime is at time-and-a-half. How much does he earn if he works 10 hours in one day?
 A. \$80 B. \$90 C. \$100 D. \$110
2. Rohit is riding his bicycle at 12 km/h. The number of metres he travels each minute is
 A. 20 B. 200 C. 400 D. 12000
3. A real estate agent's commission for selling houses is 1% for the **first** \$100 000 of the sale price and 2% for any amount **over** \$100 000. The commission earned in selling a house for \$150 000 is
 A. \$1000 B. \$1500 C. \$2000 D. \$2500
4. The value of $p^6 \times p^2 \div p$ is
 A. p^7 B. p^8 C. p^9 D. p^{12}
5. Which of the following surds is equal to $\sqrt{28}$?
 A. $2\sqrt{7}$ B. $4\sqrt{7}$ C. $\pm 2\sqrt{7}$ D. $\pm 4\sqrt{7}$
6. The expression $\log 8 + 2\log 2$ can be simplified to
 A. $\log 32$. B. $\log 16$ C. $\log 10$ D. $\log 2$
7. What amount must be invested now at 10% per annum, compounded interest, so that in two years it will have grown to \$665.50?
 A. \$450 B. \$500 C. \$550 D. \$650
8. When simplified $(\sqrt{7} - 2)(\sqrt{7} + 2)$ is equal to
 A. 3 B. 4 C. 5 D. 7
9. If the prices of smart phones have a mark-up of 20% above the cost and then a 10% discount is offered, what is the percentage profit?
 A. 0 B. 8 C. 40 D. 108
10. If a polynomial $f(x)$ is divided by $x + 2$, the remainder is
 A. $f(-2)$ B. $f(2)$ C. $f(x + 2)$ D. $f(x - 2)$

11. The graph of $xy = -5$ is obtained by reflecting the graph of $xy = 5$ in the line

- A. $y = 0$. B. $y = 1$. C. $y = x$. D. $y = -x$.

12. $\sqrt{4^{2x}}$ is equal to

- A. 4^x . B. 2^{2x} . C. $\pm 4^x$. D. $\pm 2^{\sqrt{2x}}$

13. What is the value of $\sin^2\theta + \cos^2\theta$?

- A. 0 B. 1 C. 2 D. 3

14. In which quadrant is the cosine of an angle positive but its sine is negative?

- A. 4th B. 3rd C. 2nd D. 1st

15. $\sin 60^\circ + \cos 30^\circ =$

- A. $\sqrt{3}$ B. $2\sqrt{3}$ C. $\sqrt{2}$ D. $3\sqrt{2}$

16. The solution to $x^2 \leq 2x$ is

- A. $x \leq \pm 2$ B. $0 \leq x \leq 2$ C. $0 < x < 2$ D. $x \leq 2$

17. When simplified $(x^3)^4$ is equal to

- A. x^7 B. x^{12} C. x^{15} D. x^{34}

18. $\frac{2}{\sqrt{2}}$ is equivalent to

- A. 1 B. $\sqrt{2}$ C. $2 + \sqrt{2}$ D. $2\sqrt{2}$

19. The range of the function $y = \frac{1}{x}$ is

- A. $\{y: y \neq 0, y \in R\}$ B. $\{y: y \neq 1, y \in R\}$ C. $\{y: y > 0, y \in R\}$ D. R

20. If $y = \pi^2$, $\frac{dy}{dx} =$

- A. 2π B. 0 C. 1 D. 2

21. At a sale, 10% discount is offered on all marked prices. Maya bought a dress at this sale for \$45. How much did she save?
- A. \$5 B. \$15 C. \$25 D. \$50
22. The price of a radio is \$90, which includes 12.5% VAT. What is the amount of VAT included in this price?
- A. \$10 B. \$12,50 C. \$25 D. \$80
23. The x-coordinates of the **turning point** of $y = 2x^2 - 8x + 9$ is
- A. 2 B. 3 C. 4 D. 5
24. $\int_0^5 2x =$
- A. 0 B. 5 C. 10 D. 25
25. The **gradient** function of a curve is given by $\frac{dy}{dx} = 3x^2$
The equation of the curve given that it passes through the point (0, 0) is
- A. $y = 3x^3$ B. $y = x^3$ C. $y = 3x^2 + x$ D. $y = 6x^2$
26. The nature of the roots of $f(x) = 3x^2 + 3x - 1$ is
- A. one real root B. one repeated root C. two distinct real roots D. no roots
27. The value of $9^{2x} \div 3^x$ is
- A. 3^3 B. 3^x C. 9^x D. 27^x
28. An amount of money is invested at 10% for the first year and 20% for the second year What is the percentage increase in the value of the investment?
- A. 30 B. 31 C. 32 D. 130
29. The equation of the inverse of $y = 3^x$ is
- A. $y = \log_3 x$ B. $y = \log_x 3$ C. $y = \left(\frac{1}{3}\right)^x$ D. $y = 3^x$
30. Ten friends are exchanging gifts for Christmas. If each friend gives one gift to everyone else, how many gifts were exchanged in total?
- A. 10 B. 45 C. 90 D. 100