

Entrance exam sample test for bachelor's programs: Data Science, Industrial Engineering, Software Engineering, Computer Science, International Trade, Ai in Business.

Section 1: (10 Questions - 2 Points Each)

- Simplify the expression using exponent rules: $(2x^3y^2)^3$
A) $6x^9y^6$ B) $8x^6y^5$ C) $8x^9y^6$ D) $2x^9y^6$
- Solve for x : $\frac{2x-1}{3} = 5$
A) 7 B) 8 C) 6 D) 9
- Write 0.00045 in scientific notation.
A) 4.5×10^4 B) 4.5×10^{-4} C) 45×10^{-5} D) 0.45×10^{-3}
- Solve the inequality: $-4x + 2 \geq 14$
A) $x \geq -3$ B) $x \leq -3$ C) $x \geq 3$ D) $x \leq 3$
- Two supplementary angles are in the ratio 2: 7. What is the measure of the smaller angle?
A) 20° B) 40° C) 140° D) 50°
- Factor out the Greatest Common Factor (GCF): $12a^2b - 18ab^2$
A) $6ab(2a - 3b)$ B) $6a(2ab - 3b^2)$ C) $3ab(4a - 6b)$ D) $6ab(2a + 3b)$
- A price decreases from \$80 to \$64. What is the percentage decrease?
A) 16% B) 20% C) 25% D) 80%
- If a function is defined as $f(x) = 5 - 2x$, find the value of $f(-3)$.
A) -1 B) 1 C) 11 D) -11
- Evaluate the absolute value expression: $|-8| + |-3| - |5|$

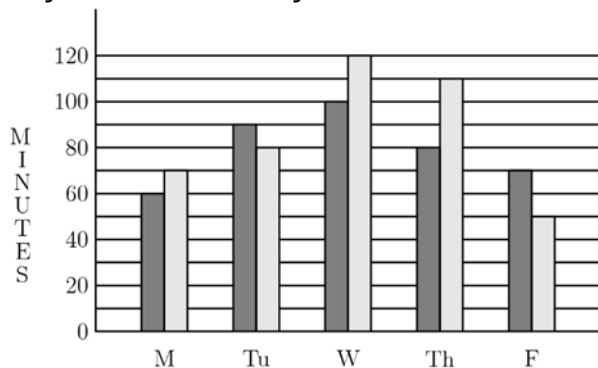
Answer: _____

- What is the y -intercept of the line given by the equation $3x - 4y = 12$?

Answer: _____

Section 2: (10 Questions - 3 Points Each)

11. Solve the system of equations: $2x + y = 7$ and $x - y = 2$. Find the value of $x \cdot y$.
- A) 3 B) 6 C) -3 D) 5
12. Which of the following is a solution to the quadratic equation $x^2 - 7x - 18 = 0$?
- A) 7 B) 2 C) -9 D) -2
13. Simplify the algebraic fraction completely: $\frac{x^2-16}{x^2+4x}$
- A) $-\frac{4}{x}$ B) $\frac{x-4}{x}$ C) $\frac{x+4}{x}$ D) $\frac{x-4}{4}$
14. A software startup uses two cloud storage services: AlphaCloud and BetaDrive. AlphaCloud charges \$0.05 per GB, and BetaDrive charges \$0.03 per GB. Last month, the startup stored a total of 10,000 GB of data and paid a total bill of \$420. How many GBs of data were stored on AlphaCloud?
- A) 4000 GB B) 5000 GB C) 6000 GB D) 7000 GB
15. Two fair 6-sided dice are rolled. What is the probability that the sum of the numbers is exactly 8?
- A) $\frac{5}{36}$ B) $\frac{1}{6}$ C) $\frac{1}{9}$ D) $\frac{7}{36}$
16. The graph shows the number of minutes studied by both Asha (black bar) and Sasha (grey bar) in one week. On the average, how many more minutes per day did Sasha study than Asha?



- A) 6 B) 8 C) 9 D) 12
17. How many three-digit numbers have at least one digit equal to 7?
- A) 252 B) 271 C) 243 D) 260
18. Solve the equation for x : $\sqrt{2x + 1} = 5$
- A) 2 B) 12 C) 24 D) 13

19. What is the vertex of the parabola $y = x^2 - 6x + 5$? Write your answer as an (x, y) coordinate pair.

Answer: _____

20. Find the 15th term of the arithmetic sequence where the first term is 10 and the common difference is -3 .

Answer: _____

Section 3: (10 Questions - 5 Points Each)

21. A farmer has chickens and pigs. There are 40 heads and 114 legs in total. How many pigs does the farmer have?

Answer: _____

22. Solve the rational equation for x : $\frac{2}{x-3} + \frac{1}{x+3} = \frac{10}{x^2-9}$

Answer: _____

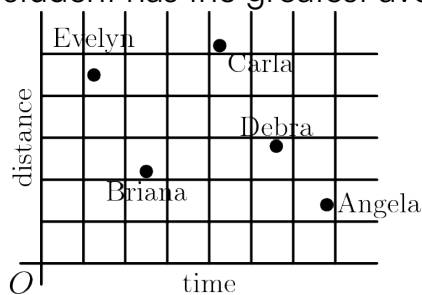
23. The length of a rectangle is 3 cm more than twice its width. The area of the rectangle is 44 cm^2 . Find the width of the rectangle.

Answer: _____

24. Two software engineers, Alex and Ben, are tasked with fixing bugs in a new app. Working alone, it would take Alex 10 hours to fix all the bugs, while Ben would take 15 hours to do the same job alone. If they work together at their respective constant rates, how many hours will it take them to fix all the bugs?

Answer: _____

25. The results of a cross-country team's training run are graphed below. Which student has the greatest average speed?



Answer: _____

26. Find the equation of the line that is perpendicular to $y = \frac{1}{2}x - 4$ and passes through the point $(3, -1)$. Write your answer in slope-intercept form ($y = mx + b$).

Answer: _____

27. Evaluate the logarithmic expression: $\log_2(32) - \log_3(9)$

Answer: _____

28. The 2nd term of a geometric sequence is 6, and the 5th term is 162. Find the common ratio (r) of this sequence.

Answer: _____

29. How many four-digit numbers have all distinct digits?

Answer: _____

30. An e-commerce website uses a search algorithm to process customer queries. The total processing time T (in milliseconds) required to search through x thousand products is given by the formula $T = x^2 - 4x + 15$. If a specific search query took exactly 60 milliseconds to process, how many thousands of products were searched? (Assume $x > 0$)

Answer: _____