

Practice Worksheet — Grade 12 Mathematics

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Averages

1. Seven service calls took 42, 47, 51, 51, 58, 63 and 70 minutes. What is the median time, in minutes?

Answer: _____ (min)

Derivatives

2. Use the definition of the derivative to find $f'(3)$ for $f(x) = x^2$.

Answer: _____

Integrals

3. Evaluate the definite integral of $3x^2$ with respect to x from $x = 0$ to $x = 2$.

Answer: _____

Limits

4. For $f(x) = 1/x$, what happens to the graph as x approaches 0?
- a) it becomes negative on both sides
 - b) it approaches a vertical asymptote
 - c) it crosses the x -axis at the origin
 - d) it flattens out towards a maximum value

Logarithms

5. $\log_2(8) = ?$

Answer: _____

Math30 1 logarithms

6. An investment of \$5 000 grows at 6% per year, compounded annually. After how many years is it first worth \$8 000? Give your answer in years, rounded to one decimal place.

Answer: _____ (years)

Math30 1 permutations and combinations

7. How many ways can you arrange 4 different books on a shelf? (4!)

Answer: _____

Math30 1 rational functions

8. For $f(x) = 1/(x-4)$, what value of x is not allowed (the vertical asymptote)?

Answer: _____

Math30 1 sequences and series

9. Find the 5th term of the arithmetic sequence 3, 7, 11, 15, ...

Answer: _____

Math30 1 trigonometric functions

10. In which quadrants is the cosine function negative?

- a) the first and fourth quadrants
- b) the second and third quadrants
- c) the first and second quadrants
- d) the third and fourth quadrants

Math30 2 exponential and log models

11. For the rational expression $(x + 3) / (x^2 - 4)$, what are the non-permissible values of x ?

- a) $x = 4$ and $x = -4$
- b) $x = 2$ and $x = -2$
- c) $x = -3$
- d) $x = 2$, $x = -2$ and $x = -3$

Math30 2 probability and odds

12. A school uniform can be put together from 4 different shirts, 3 different pairs of trousers and 2 different pairs of shoes. If one of each item is chosen, how many different complete outfits are possible?

Answer: _____

Math30 2 sets and reasoning

13. A survey of 120 students asked about after-school activities. It found that 68 play a sport, 45 play a musical instrument, and 22 do both. How many of the students surveyed do neither?

Answer: _____

Math30 3 averages and percentiles

14. A course grade is made up of assignments worth 20%, quizzes worth 30% and a final exam worth 50%. A student averages 78 on assignments, 85 on quizzes and 72 on the final. What is the final grade, rounded to one decimal place?

Answer: _____

Math30 3 linear relations in context

15. A plumber's bill is a straight-line relation. A 2 hour job costs \$140 and a 6 hour job costs \$260. What is the hourly rate, in dollars per hour?

Answer: _____

Math30 3 probability in context

16. A quality inspector checks 500 items and finds that 35 need rework. Based on this rate, how many items in a shipment of 4 000 would be expected to need rework?

Answer: _____

Math30 3 tolerance and percent error

17. For that same bolt, specified at $12.50 \text{ mm} \pm 0.05 \text{ mm}$, what is the full width of the acceptable range, in millimetres?

Answer: _____ (mm)

Math30 3 triangles and transformations

18. A triangular brace has two sides of 14 cm and 9 cm with an angle of 62° between them. How long is the third side, in centimetres, rounded to one decimal place?

Answer: _____ (cm)

Math30 3 vehicle and business costs

19. A car lease requires \$3 000 down and 48 monthly payments of \$389. What is the total amount paid over the term of the lease, in dollars?

Answer: _____

Math31 applications of derivatives

20. For $f(x) = x^3 - 3x^2 + 2$, find the x-coordinate of the local minimum.

Answer: _____