ALBERTA MATH 30-2 · UNIT 5 · 25 QUESTIONS

Polynomial Functions — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The end behaviour of the graph of $y = x^3$ is best described by**

- **A** As $x \to -\infty$, $y \to \infty$ and as $x \to \infty$, $y \to -\infty$
- **B** As $x \to -\infty$, $y \to -\infty$ and as $x \to \infty$, $y \to \infty$
- **C** As $x \to -\infty$, $y \to \infty$ and as $x \to \infty$, $y \to \infty$
- **D** As $x \to -\infty$, $y \to -\infty$ and as $x \to \infty$, $y \to -\infty$

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2 **Which of the following functions is a cubic function?**

- **A** $y = 4x^2 - 3x + 1$
- **B** $y = 6x - 5$
- **C** $y = 2x^3 - x^2 + 7$
- **D** $y = x^4 + 2x$

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3 **The y-intercept of the graph of $f(x) = 3x^3 + 2x^2 - x + 6$ is**

A 6

B -6

C 2

D -1

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4 **The graph below shows a polynomial function. The number of x-intercepts of the graph is**

A 0

B 1

C 2

D 3

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5 **If $f(x) = x^3 - 2x^2 + x - 5$, then the value of $f(2)$ is Record your answer as an integer.**

ANSWER _____

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6 **The graph below shows a cubic function. The number of turning points on the graph is**

A 1

B 2

C 3

D 4

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7 **The graph of a cubic function has x-intercepts of -3, 0, and 5. As $x \to -\infty$, $y \to \infty$, and as $x \to \infty$, $y \to -\infty$. An equation of the function is**

- **A** $y = x(x + 3)(x - 5)$
- **B** $y = -x(x - 3)(x + 5)$
- **C** $y = (x + 3)(x - 5)$
- **D** $y = -x(x + 3)(x - 5)$

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8 **An open box is made from a 20 cm by 14 cm sheet of cardboard by cutting squares of side length x cm from each corner and folding up the sides. An expression for the volume of the box, V(x), in cm^3, is**

- **A** $V(x) = x(20 - x)(14 - x)$
- **B** $V(x) = (20 - 2x)(14 - 2x)$
- **C** $V(x) = x(20 - 2x)(14 - 2x)$
- **D** $V(x) = x(20 + 2x)(14 + 2x)$

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9 **A set of data is plotted, and the points rise, then fall, and then rise again, changing direction twice. The lowest degree of a polynomial function that models the data well is**

- A 3
- B 1
- C 2
- D 4

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10 **If $P(x) = 2x^3 - x^2 + 4x + 1$, then the value of $P(-1)$ is Record your answer as an integer.**

ANSWER _____

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11 **The end behaviour of the graph of $f(x) = -x^3 + 4x^2 - 2$ is best described by**

- **A** As $x \to -\infty$, $y \to -\infty$ and as $x \to \infty$, $y \to \infty$
- **B** As $x \to -\infty$, $y \to \infty$ and as $x \to \infty$, $y \to \infty$
- **C** As $x \to -\infty$, $y \to \infty$ and as $x \to \infty$, $y \to -\infty$
- **D** As $x \to -\infty$, $y \to -\infty$ and as $x \to \infty$, $y \to -\infty$

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12 **The graph below shows a cubic function. An equation of the function is**

- **A** $y = (x + 5)(x - 1)(x - 2)$
- **B** $y = -(x + 5)(x - 1)(x - 2)$
- **C** $y = 2(x + 5)(x - 1)(x - 2)$
- **D** $y = (x - 5)(x + 1)(x + 2)$

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13 **The volume of an open box is modelled by V(x) = x(12 - 2x)(10 - 2x), where x is the side length, in centimetres, of the squares cut from the corners. The values of x that make sense in this context are**

A $0 < x < 6$

B $0 < x < 5$

C $x > 0$

D $0 < x < 10$

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14 **The y-intercept of the graph of f(x) = (x + 2)(x - 1)(x - 4) is Record your answer as an integer.**

ANSWER _____

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15 **The graph of a cubic function has a local maximum value of 6 and a local minimum value of -3. The range of the function is**

- **A** $-3 \leq y \leq 6$
- **B** $y \geq -3$
- **C** $y \leq 6$
- **D** All real numbers

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16 **Which statement is true for every cubic function?**

- **A** It has exactly three x-intercepts.
- **B** It has at least one x-intercept.
- **C** It has exactly two turning points.
- **D** Its y-intercept is positive.

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17 **Squares with side length 2 cm are cut from the corners of a 16 cm by 10 cm sheet of metal, and the sides are folded up to form an open box. The volume of the box, in cm^3, is Record your answer as an integer.**

ANSWER _____

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18 **A quadratic function has x-intercepts of -3 and 5 and a y-intercept of -30. If its equation is written as y = a(x + 3)(x - 5), then the value of a is**

A -2

B -1

C 2

D 3

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19 **The graph below shows a polynomial function. The local maximum value of the function is**

A 7

B -1

C 3

D -2

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20 **The sum of the zeros of the function f(x) = 2(x - 1)(x + 3)(x - 2) is Record your answer as an integer.**

ANSWER _____

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21 **A cubic function is used to model snowfall data collected from 2005 to 2020. The model is then used to predict the snowfall in 2035. This prediction is**

A Interpolation, and it is reliable

B Interpolation, and it is unreliable

C Extrapolation, and it is always accurate

D Extrapolation, and it may be unreliable

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22 **A polynomial function has degree 3 and a negative leading coefficient. Which description could describe its graph?**

A It rises to the right and has no x-intercepts.

B It falls to the right and crosses the x-axis at least once.

C It rises at both ends.

D It has four turning points.

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23 **Squares with side length 3 cm are cut from the corners of a 24 cm by 18 cm sheet of cardboard, and the sides are folded up to form an open box. The volume of the box, in cm^3, is Record your answer as an integer.**

ANSWER _____

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24 **The graph below shows a cubic function. The function is decreasing on the interval**

A $x < -1$

B $x > 2$

C $-1 < x < 2$

D $-2 < x < 1$

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25 **A cubic function has x-intercepts of -2, 1, and 3 and passes through the point (0, -12). If its equation is written as $y = a(x + 2)(x - 1)(x - 3)$, then the value of a is Record your answer as an integer.**

ANSWER _____

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ANSWER KEY

1. B
2. C
3. A
4. D
5. -3
6. B
7. D
8. C
9. A
10. -6
11. C
12. A
13. B
14. 8
15. D
16. B
17. 144
18. C
19. A
20. 0
21. D
22. B
23. 648
24. C
25. -2

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