NUNAVUT MATH 30-1 · 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 **When $P(x) = 2x^3 - 5x^2 + 3x - 7$ is divided by $(x - 2)$, the remainder is**

- A 3
- B -13
- C 11
- D -5

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2 **Which of the following binomials is a factor of the polynomial function $f(x) = x^3 - 2x^2 - 5x + 6$?**

- A $(x + 3)$
- B $(x - 1)$
- C $(x - 4)$
- D $(x + 1)$

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3 **For the function $f(x) = -3x^4 + 2x^2 - x + 5$, the degree and leading coefficient are**

- A Degree 4, leading coefficient 3
- B Degree 5, leading coefficient -3
- C Degree 4, leading coefficient -3
- D Degree 2, leading coefficient -3

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4 **If $P(x) = x^3 - 6x^2 + 11x - 6$, then the value of $P(3)$ is**

- A 0
- B 6
- C -2
- D 2

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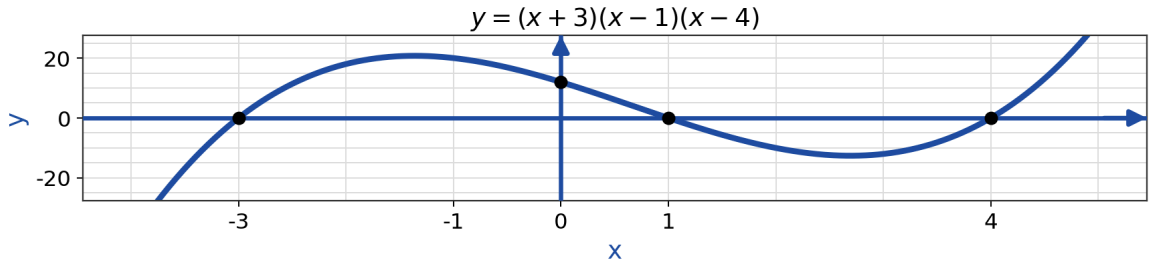
5 **The graph below shows a polynomial function. The x-intercepts of the graph are**



- **A** -3, 1, -4
- **B** -3, 1, 4
- **C** 3, -1, 4
- **D** 3, 1, -4

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6 **When $2x^3 - 3x^2 - 8x + 12$ is divided by $(x - 2)$, the quotient is**

- **A** $2x^2 - x - 6$
- **B** $2x^2 + x + 6$
- **C** $2x^2 + x - 6$
- **D** $2x^2 - 7x + 6$

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7 When $x^3 + kx^2 - 5x + 3$ is divided by $(x + 2)$, the remainder is 13. The value of k is

- A 2
- B -2
- C 3
- D -3

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8 If $(x - 3)$ is a factor of $x^3 - 5x^2 + 2x + k$, then the value of k is

- A -12
- B 8
- C -8
- D 12

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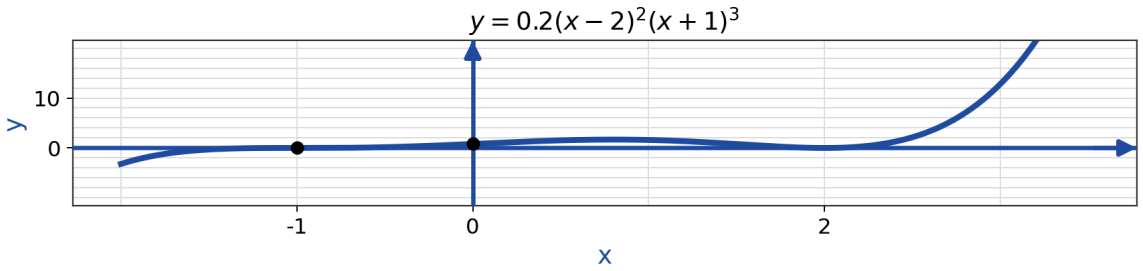
9 **The graph below shows a polynomial function. Which statement about the graph at x = 2 is true?**



A The graph crosses the x-axis at x = 2

B The graph touches the x-axis and turns around at x = 2

C The graph crosses the x-axis with a point of inflection at x = 2

D The graph has a vertical asymptote at x = 2

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10 **A polynomial function of degree 3 has zeros of -4, 0, and 5. The function could be**

- **A** $f(x) = x(x + 4)(x - 5)$
- **B** $f(x) = x(x - 4)(x + 5)$
- **C** $f(x) = x(x + 4)(x + 5)$
- **D** $f(x) = x(x - 4)(x - 5)$

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11 **For the polynomial function $P(x) = x^4 - 2x^3 - 7x^2 + 8x + 12$, two of the zeros are 3 and -2. The largest zero of this function is**

ANSWER _____

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12 **In the process of factoring the polynomial $P(x) = x^3 + 2x^2 - 5x - 6$, a student determines that $(x + 3)$ is a factor. The remaining factor is**

- **A** $x^2 + x - 2$
- **B** $x^2 - x + 2$
- **C** $x^2 + 2x - 2$
- **D** $x^2 - x - 2$

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13 **Three statements about the polynomial function $P(x) = 2x^3 - 3x^2 - 11x + 6$ are shown below. Statement 1: When $P(x)$ is divided by $(x - 3)$, the remainder is 0. Statement 2: $(x - 2)$ is a factor of $P(x)$. Statement 3: $P(-2) = 0$, so $(x + 2)$ is a factor of $P(x)$. The two statements that are correct are**

- **A** 1 and 2
- **B** 1 and 3
- **C** 2 and 3
- **D** 1, 2, and 3

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14 **Given $P(x) = a(x - b)^2(x + c)$, where $a > 0$, $b > 0$, and $c > 0$, the x-intercept with multiplicity 2 is i, and the y-intercept is ii.**

A i: $x = -b$ ii: the y-intercept is positive

B i: $x = b$ ii: the y-intercept is negative

C i: $x = b$ ii: the y-intercept is positive

D i: $x = -c$ ii: the y-intercept is positive

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15 **A cubic polynomial function has zeros of -1, 2, and 4. If $P(0) = 16$, then the value of $P(3)$ is**

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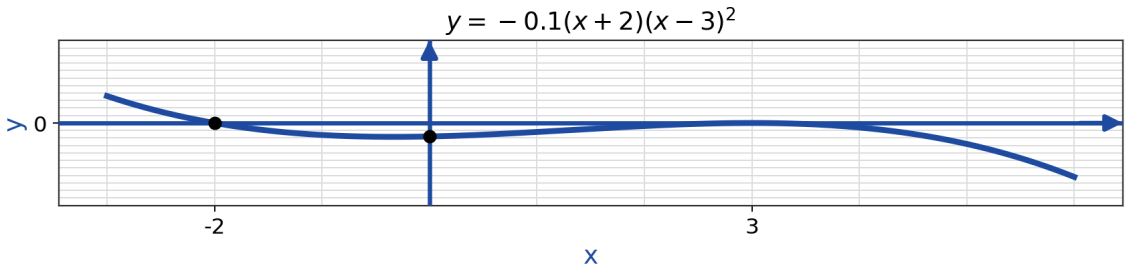
16 **The graph below shows a polynomial function of degree 3. As x approaches infinity, f(x) approaches**



A +∞

B -∞

C 0

D 3

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17 **The graph of the function $P(x) = a(x - r)(x + 2)^2$ passes through the point (0, 8). The value of a in terms of r is**

A $a = \frac{2}{}$

B $a = -\frac{2}{}$

C $a = -\frac{r}{}$

D $a = \frac{8}{}$

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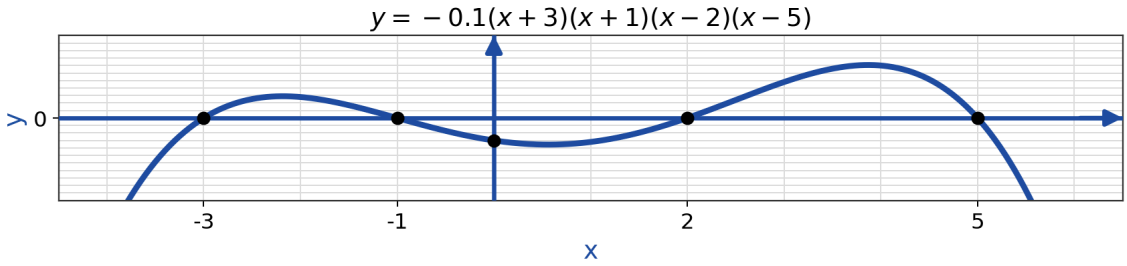
18 **The graph below shows a quartic polynomial function. The x-intercepts of the graph are**



A -3, -1, 2, 5

B -3, 1, -2, 5

C 3, -1, 2, -5

D -3, -1, -2, 5

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19 **A polynomial function has a factor of (x - 1) with multiplicity 2, a factor of (x + 4), and P(0) = -24. The minimum possible degree and the leading coefficient of the function are**

A Minimum possible degree: 3 Leading coefficient: -6

B Minimum possible degree: 3 Leading coefficient: 6

C Minimum possible degree: 4 Leading coefficient: -6

D Minimum possible degree: 5 Leading coefficient: -6

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20 **When $2x^4 - 3x^3 + x - 5$ is divided by (x + 1), the remainder is**

ANSWER _____

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21 The solutions to the equation $x^3 - 4x^2 - 11x + 30 = 0$ are

- A -2, 3, 5
- B -3, -2, 5
- C -3, 2, 5
- D 2, 3, -5

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22 The degree of the polynomial function $f(x) = -2x(x - 3)^3(x + 1)^2$ is

ANSWER _____

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23 When $x^4 - 3x^2 + 5x - 2$ is divided by $(x - 2)$, the remainder is

ANSWER _____

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24 **A quartic polynomial function has zeros of -2 (multiplicity 2), 1, and 3, and its graph passes through the point (0, 24). The value of P(-1) is**

ANSWER _____

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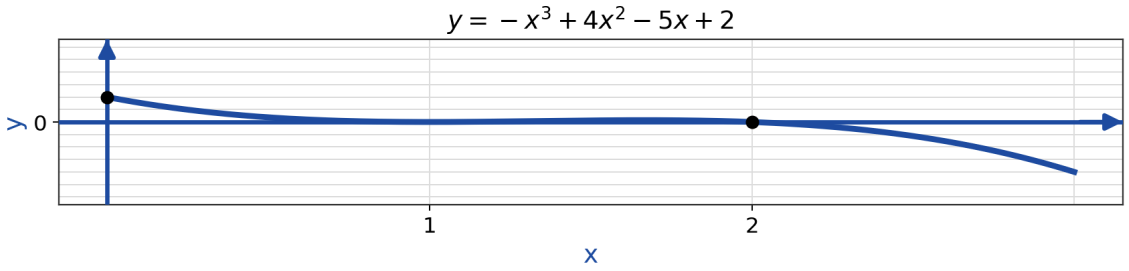
25 **The graph below shows a polynomial function. The behaviour of the graph at x = 1 is i, and the end behaviour as x → ∞ is ii.**



A i: the graph crosses the x-axis ii: f(x) → -∞

B i: the graph touches the x-axis and turns ii: f(x) → ∞

C i: the graph crosses with a point of inflection ii: f(x) → -∞

D i: the graph touches the x-axis and turns ii: f(x) → -∞

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ANSWER KEY

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

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