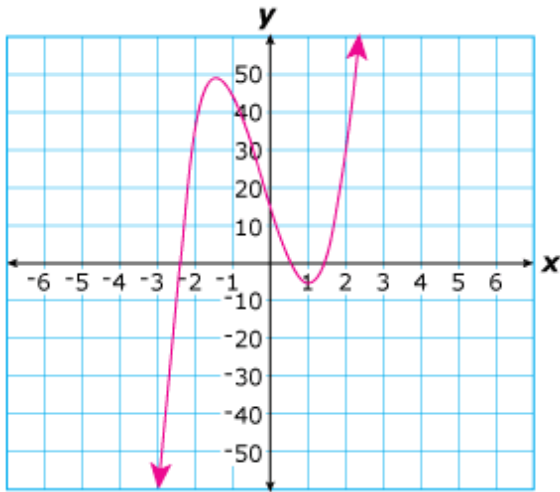


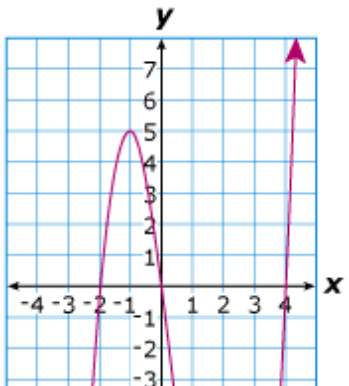
1.

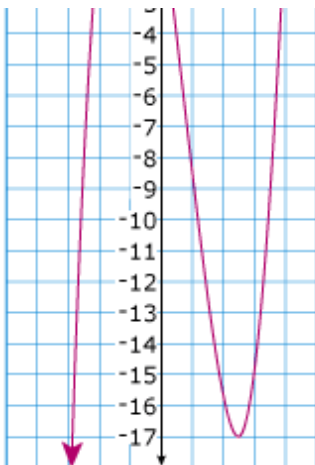


Which equation is **best** represented by the graph above?

- $y = (2x - 1)(2x - 3)(2x + 5)$
- $y = (2x + 1)(2x + 3)(2x - 5)$
- $y = -(2x + 1)(2x + 3)(2x - 5)$
- $y = (2x + 1)(2x + 3)(2x + 5)$

2.





What are the apparent zeroes of the function graphed above?

- $\{-1, 2.5\}$
- $\{-17, 5\}$
- $\{-4, 0, 2\}$
- $\{-2, 0, 4\}$

3. What is a polynomial function in standard form with zeroes 1, 2, -3 , and -3 ?

- $g(x) = x^4 + 3x^3 - 7x^2 - 15x + 18$
- $g(x) = x^4 + 3x^3 - 7x^2 + 2x + 18$
- $g(x) = x^4 - 3x^3 + 7x^2 + 15x + 18$
- $g(x) = x^4 - 3x^3 - 7x^2 + 15x + 18$

4. What are the zeroes of the function? What are their multiplicities?

$$f(x) = 5x^3 - 5x^2 - 30x$$

- The numbers 3, -2 , and 0 are zeroes of multiplicity 1.
- The numbers 3, -2 , and 0 are zeroes of multiplicity 2.
- The numbers -3 , 2, and 0 are zeroes of multiplicity 1.
- The numbers -3 , 2, and 0 are zeroes of multiplicity 2.

5. What are the real and complex solutions of the polynomial equation? (

$$x^3 - 64 = 0$$

- 4, $-1 + 2i\sqrt{3}$, $-1 + 2i\sqrt{3}$
- 4, $1 + 2i\sqrt{3}$, $1 + 2i\sqrt{3}$
- 4, $-2 + 2i\sqrt{3}$, $-2 - 2i\sqrt{3}$
- 4, $-2 + 2i\sqrt{3}$, $2 + 2i\sqrt{3}$

6. Which is equivalent to the following expression?

$$(3p^2 + 5pq - q^2) + (p^2 + 3pq - 2q^2)$$

- $3p^2 + 8pq - 3q^2$
- $4p^2 + 8pq + q^2$
- $4p^4 + 8pq - 3q^4$
- $4p^2 + 8pq - 3q^2$

7. Which is a factored form of $216p^3 + 125q^3$?

- $(6p + 5q)(36p^2 + 30pq + 25q^2)$
- $(6p + 5q)(36p^2 - 30pq - 25q^2)$
- $(6p + 5q)(36p^2 + 30pq - 25q^2)$
- $(6p + 5q)(36p^2 - 30pq + 25q^2)$

8. Divide $-2x^3 - 5x^2 + 4x + 2$ by $x + 2$.

- $-2x^2 - x + 6$
- $-2x^2 - x + 6, R 14$

- $-2x^2 - x + 6, R(-10)$
- $-2x^2 - 9x + 22, R(-42)$

9. Find the roots of the polynomial equation

$$x^3 - 4x^2 + x + 26 = 0$$

- $3 \pm 2i, -2$
- $-3 \pm 2i, -2$
- $3 \pm 2i, 2$
- $-3 \pm 2i, 2$

10. Which correctly describes the roots of the following cubic equation?

$$x^3 + 6x^2 + 11x + 6$$

- one real root, two complex roots
- two real roots and one complex root
- three real roots, two of which are equal in value
- three real roots, each with a different value

11. One zero of $f(x) = x^3 - 6x^2 + 11x - 6$ is 3. What are the other zeroes of the function?

- 1 and 3
- 1 and -2
- 1 and 2
- 1 and 3

12. Which of the following quartic functions has $x = -2$ and $x = -3$ as its only two real zeroes?

- $x^4 - 5x^3 + 7x^2 - 5x + 6$
- $x^4 + 5x^3 + 7x^2 + 5x + 6$

$x^4 + 5x^3 + 7x^2 - 5x - 6$

$x^4 - 5x^3 + 7x^2 + 5x - 6$

13. What are the real and complex solutions of the polynomial equation?

$$x^4 - 41x^2 = -400$$

14. Use synthetic division to find $P(-3)$ for $P(x) = x^4 - 2x^3 - 4x + 4$.

15. Find all the zeroes of the equation. (2 points)

$$x^4 - 6x^2 - 7x - 6 = 0$$

16. Use Pascal's triangle to expand the binomial.

$$(d - 5y)^6$$

17. What is the equation of $y = x^3$ with the given transformations?
vertical compression by a factor of $\frac{1}{7}$, horizontal shift 8 units to the left, reflection across the x -axis

18. What are all the real zeroes of $y = (x - 12)^3 - 7$?

19. Explain how to determine the end behavior of a polynomial.



20. Can you always use synthetic division for dividing polynomials? Explain.



21.

If $2 + \sqrt{3}$ is a polynomial root, name another root of the polynomial, and explain how you know it must also be a root.



22. How can you quickly determine the number of roots a polynomial will have by looking at the equation?



23. Is $y = \frac{1}{4}x^{0.5}$ a power function? Explain your reasoning.

