

Precalculus - Polynomial Functions and Their Graphs - Quiz

Common Core F-IF.C.7c, A-APR.B.3, F-IF.B.4 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Answer 10 multiple-choice questions on polynomial graphs, zeros and end behavior.
Explanations point out typical mistakes such as mixing up the sign of a zero.

Precalculus · Common Core State Standards: **F-IF.C.7c, A-APR.B.3, F-IF.B.4**

Questions

Question 1

What is the degree of $f(x) = 4x^3 - x^5 + 2$?

- A. 3
- B. 4
- C. 5
- D. 2

Question 2

Which end behavior fits $f(x) = -x^3 + 2x$?

- A. Left down, right up
- B. Both ends up
- C. Both ends down
- D. Left up, right down

Question 3

A zero of multiplicity 2 means the graph...

- A. Crosses the x-axis
- B. Touches the x-axis and turns
- C. Has a vertical asymptote
- D. Never reaches the x-axis

Question 4

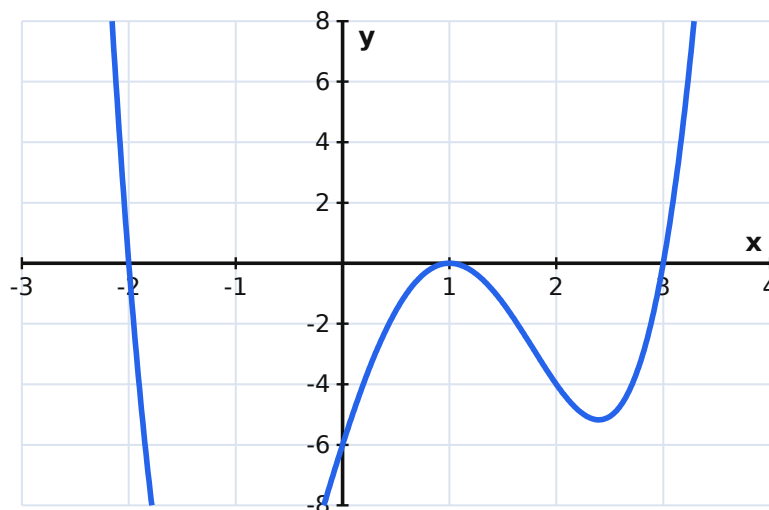
What are the zeros of $f(x) = (x-2)(x+5)$?

- A. -2 and 5
- B. 2 and -5

- C. 2 and 5
- D. -2 and -5

Question 5

The graph shows a polynomial. How many real zeros does it have, counting multiplicity?



Graph of a quartic.

- A. 4
- B. 3
- C. 2
- D. 5

Question 6

A polynomial has degree 5. What is the greatest possible number of turning points?

- A. 5
- B. 3
- C. 6
- D. 4

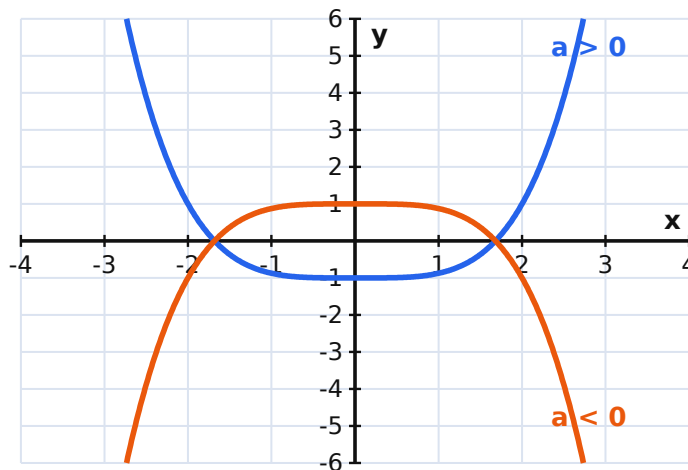
Question 7

What is the y -intercept of $f(x) = (x+2)(x-3)$?

- A. 6
- B. -1
- C. -6
- D. 5

Question 8

Which description matches the graph?

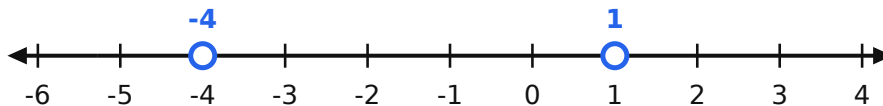


Two even-degree graphs.

- A. Ends point opposite directions
- B. Both ends point the same direction
- C. The graph is a line
- D. It has no turning point

Question 9

Solve $(x-1)(x+4) < 0$ using the number line.



Zeros at -4 and 1.

- A. $(-4, 1)$
- B. $(-\infty, -4) \cup (1, \infty)$
- C. $[-4, 1]$
- D. $(-1, 4)$

Question 10

Which cubic has zeros $-1, 2, 3$ and rises on the right?

- A. $(x+1)(x-2)(x-3)$
- B. $-(x+1)(x-2)(x-3)$
- C. $(x-1)(x+2)(x+3)$
- D. $(x+1)(x-2)^2(x-3)$

Answers

1. **C** - The degree is the highest exponent, 5, even though it is not written first.
2. **D** - Odd degree with a negative leading coefficient: left up, right down.
3. **B** - Even multiplicity bounces off the axis.
4. **B** - Set each factor to zero: $x = 2$ and $x = -5$. The sign flips when moving the constant across.
5. **A** - It crosses at -2 and 3 and touches at 1 (multiplicity 2): $1 + 2 + 1 = 4$.
6. **D** - A polynomial of degree n has at most $n - 1$ turning points.
7. **C** - $f(0) = (2)(-3) = -6$. Using the zeros instead gives the x-intercepts.
8. **B** - Even-degree polynomials have ends that both go up or both go down.
9. **A** - The product is negative between the zeros -4 and 1. The endpoints are excluded for a strict inequality.
10. **A** - Each zero gives a factor $(x - r)$, and a positive leading coefficient with odd degree rises on the right.

Remember

- Degree n : at most n real zeros and at most $n - 1$ turning points.
- Even degree: both ends point the same way; odd degree: opposite ways.
- Positive leading coefficient: right end rises. Negative: right end falls.
- Odd multiplicity crosses the axis; even multiplicity touches it.
- $f(0)$ gives the y-intercept; a sign chart solves polynomial inequalities.