

Precalculus - Polynomial Division and the Factor Theorem - Quiz

Common Core A-APR.B.2, A-APR.D.6, A-APR.B.3 · maths-pdf.fr/en/

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

Pick the best answer for 10 questions on polynomial division, remainders and factors.
Explanations flag typical sign and placeholder mistakes.

Precalculus · Common Core State Standards: **A-APR.B.2, A-APR.D.6, A-APR.B.3**

Questions

Question 1

What is the remainder when x^2+3x-4 is divided by $x-1$?

- A. -4
- B. 0
- C. 1
- D. 4

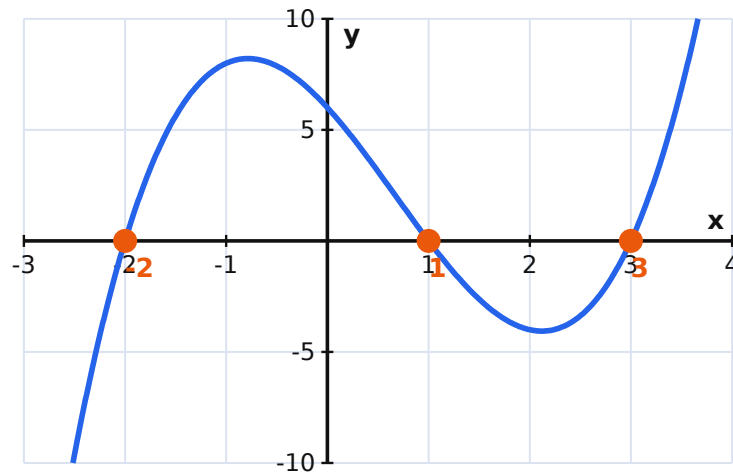
Question 2

Which value of c is used to divide by $x+5$ with synthetic division?

- A. 5
- B. $\frac{1}{5}$
- C. $-\frac{1}{5}$
- D. -5

Question 3

The graph of f crosses the x -axis at $x=3$. Which must be a factor of $f(x)$?



Graph crossing at 3.

- A. $x-3$
- B. $x+3$
- C. $3x$
- D. $x-9$

Question 4

The synthetic division below divides by $x-2$. What is the quotient?

2	1	-4	1	6
		2	-4	-6
	1	-2	-3	0

Synthetic division.

- A. x^2+2x-3
- B. x^2-2x-3
- C. x^2-2x+3
- D. x^3-2x^2-3x

Question 5

Which is a possible rational zero of $3x^3+x-4$?

- A. $\frac{1}{3}$
- B. $\frac{1}{2}$
- C. $\frac{1}{4}$
- D. $\frac{1}{6}$

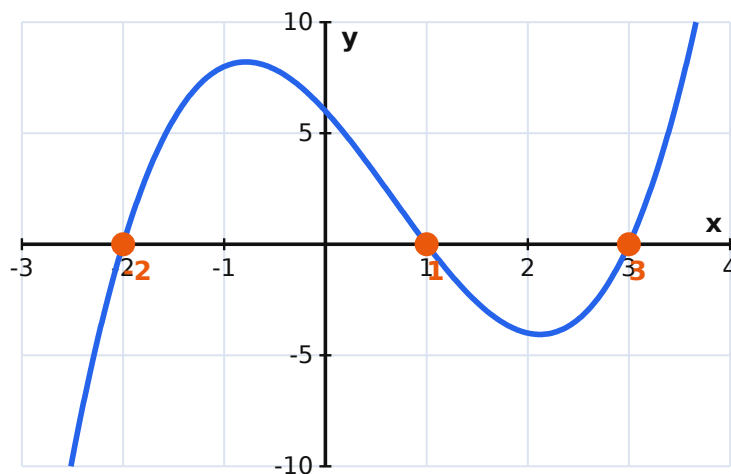
Question 6

What is the remainder when $f(x) = x^3 - 2x + 1$ is divided by $x+2$?

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

Question 7

The graph shows a polynomial with zeros at -2 , 1 and 3 . Which is a factor?



Graph of a cubic.

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

Question 8

How many zeros (counting complex) does a degree-4 polynomial have?

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

Question 9

In synthetic division, what do you write for a missing x^2 term in x^3+5x-2 ?

- A. 0
- B. 1
- C. Nothing, skip it
- D. x^2

Question 10

After dividing $x^3 - 2x^2 - 5x + 6$ by $x - 3$, which factored form is correct?

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

Answers

1. **B** - $f(1) = 1 + 3 - 4 = 0$, so $x - 1$ is a factor. Using -4 confuses the remainder with the constant term.
2. **D** - $x + 5 = x - (-5)$, so $c = -5$.
3. **A** - By the Factor Theorem, $f(c) = 0$ means $x - c$ is a factor.
4. **B** - The bottom row 1, -2, -3, 0 gives $x^2 - 2x - 3$ with remainder 0.
5. **D** - p divides -4 and q divides 3, so $4/3$ is allowed. Reversing p and q is a common error.
6. **B** - $f(-2) = -8 + 4 + 1 = -3$. Dividing by $x + 2$ uses $c = -2$, not 2.
7. **C** - A zero at -2 gives the factor $x - (-2) = x + 2$.
8. **C** - A polynomial of degree n has exactly n zeros counting multiplicity and complex zeros.
9. **A** - Each power needs a coefficient, so the missing x^2 term has coefficient 0.
10. **A** - The quotient $x^2 + x - 2$ factors as $(x - 1)(x + 2)$.

Remember

- $f(x) = d(x)q(x) + r(x)$, with r of lower degree than d .
- Remainder Theorem: dividing by $x - c$ leaves $f(c)$.
- Factor Theorem: $x - c$ is a factor if and only if $f(c) = 0$.
- Rational Root Theorem: p divides the constant term and q divides the leading coefficient.
- Use 0 as a placeholder coefficient for each missing power.