



Divide polynomials using synthetic division

1

Find the remainder when $f(x)$ is divided by $(x + 2)$.

$$f(x) = x^4 + 2x^3 - 3x^2$$

A 0	B 12
C -12	D 20

2

Using synthetic division to divide this polynomial by this binomial, which value goes in the divisor position of the synthetic division grid?

$$\frac{x^6 - 7x^5 - 7x^4 - 23x^3 - 8x - 16}{(x - 1)}$$

?	1	7	7	-23	-8	16

A 6	B 9	C 7
D 3	E 5	F -1

3

Using synthetic division to divide this polynomial by this binomial, which set of values goes in the top row of the synthetic division grid?

$$\frac{x^5 + 3x^4 - 13x^3 - 51x^2 - 36x}{(x - 0)}$$

0	?	?	?	?	?	?

A		2	3	-13	-51	-36	0

B		1	3	-13	-51	-36	0

4

Using synthetic division to divide this polynomial by this binomial, which value is brought down into the first box of the bottom row?

$$\frac{x^3 + 3x^2 - 4x}{(x - 2)}$$

2	1	3	-4	0

A 1	B 5	C 7
D 0	E 8	F 4

5

Using synthetic division to divide this polynomial by this binomial, which value goes in the highlighted box of the bottom row?

$$\frac{x^3 + 3x^2 - 4x - 12}{(x - 2)}$$

2	1	3	-4	-12
		2	10	
	1	5	?	

A 15	B 3	C 10
D 4	E 6	F 1



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6

Using synthetic division to divide this polynomial by this binomial, which divisor and set of coefficients correctly set up the synthetic division? Hint: The divisor is the value that makes the binomial zero, and the coefficients go in order from the highest power of x to the lowest.

$$\frac{3x^3 + x^4 - 4x}{(x + 1)}$$

?	?	?	?	?	?

A

-1	0	-4	0	3	1

B

-1	1	3	0	-4	0

7

Using synthetic division to divide this polynomial by this binomial, which divisor and set of coefficients correctly set up the synthetic division?

$$\frac{x^3 - 48 + 3x^2 - 16x}{(x + 4)}$$

?	?	?	?	?

A

-4	1	3	-16	-48

B

4	-48	-16	3	1



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8

Using synthetic division to divide this polynomial by this binomial, which values complete the bottom row of the synthetic division?

$$\frac{x^3 + 7x^2 + 16x + 12}{(x + 2)}$$

-2	1	7	16	12
	?	?	?	?

A

	2	5	6	0

B

	1	5	6	0

9

Using synthetic division to divide this polynomial by this binomial, what is the resulting quotient and remainder?

$$\frac{x^4 - 10x^2 + 9}{(x - 1)}$$

1	1	0	-10	0	9

A

$$2x^3 + x^2 - 9x - 9$$

B

$$x^3 + x^2 - 9x - 9$$

C

$$x^3 + x^2 - 9x - 9 + \frac{1}{(x - 1)}$$

D

$$x^4 + x^3 - 9x^2 - 9x$$



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10

Use synthetic division to divide this polynomial by this binomial. Is the binomial a factor?

$$\frac{x^4 - 2x^3 - 7x^2 - 4x}{(x - 1)}$$

A

No

B

Yes

12

Use synthetic division to divide this polynomial by this binomial. What is the result?

$$\frac{x^3 - 13x - 12}{(x + 3)}$$

A

$$x^2 - 3x - 4$$

B

$$x^3 - 3x^2 - 4x$$

C

$$2x^2 - 3x - 4$$

D

$$x^2 - 3x - 4 + \frac{1}{(x + 3)}$$

11

Use synthetic division to divide this polynomial by this binomial. What is the result?

$$\frac{x^3 - 4x}{(x + 4)}$$

A

$$x^2 - 4x + 12 - \frac{48}{(x + 4)}$$

B

$$2x^2 - 4x + 12 - \frac{48}{(x + 4)}$$

C

$$x^2 - 4x + 12 + \frac{48}{(x + 4)}$$

D

$$x^3 - 4x^2 + 12x - 48$$

13

Using synthetic division to divide this polynomial by this binomial, what is the resulting quotient and remainder? Hint: The quotient's first term is one degree lower than the original polynomial, and the last bottom-row value is the remainder.

$$\frac{x^3 - 6x^2 + 11x - 6}{(x - 2)}$$

A

$$x^3 - 4x^2 + 3x$$

B

$$2x^2 - 4x + 3$$

C

$$x^2 - 4x + 3$$

D

$$x^2 - 4x + 3 + \frac{1}{(x - 2)}$$



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- 14** Using synthetic division to divide this polynomial by this binomial, what is the resulting quotient and remainder?

$$\frac{x^4 + 3x^3 - 7x^2 - 27x - 18}{(x + 1)}$$

-1	1	3	-7	-27	-18
		-1	-2	9	18
	1	2	-9	-18	0

A $x^4 + 2x^3 - 9x^2 - 18x$

B $2x^3 + 2x^2 - 9x - 18$

C $x^3 + 2x^2 - 9x - 18$

D $x^3 + 2x^2 - 9x - 18 + \frac{1}{(x + 1)}$

- 15** Using synthetic division to divide this polynomial by this binomial, what is the resulting quotient and remainder?
Hint: The quotient's first term is one degree lower than the original polynomial, and the last bottom-row value is the remainder.

$$\frac{x^4 + 5x^3 - 20x - 16}{(x + 1)}$$

-1	1	5	0	-20	-16
		-1	-4	4	16
	1	4	-4	-16	0

A $x^3 + 4x^2 - 4x - 16$

B $x^4 + 4x^3 - 4x^2 - 16x$

C $x^3 + 4x^2 - 4x - 16 + \frac{1}{(x + 1)}$

D $2x^3 + 4x^2 - 4x - 16$