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QUESTION 1



Drag and drop the correct answer into the space(s) provided.

Write a polynomial that has the zeros

$10, -2$, and $-1 + 2i$

.

$$f(x) = x^4$$

 x^3  x^2  x 

QUESTION 2



Drag and drop the correct answer into the space(s) provided.

Write this function as a product of linear factors and an irreducible quadratic factor.

$$d(x) = x^4 - 2x^3 - 13x^2 - 4x - 30$$

The rational zeros for the function are within the interval

$$[-5, 6]$$

$$d(x) = (x +$$



$$)(x -$$



$$)(x^2 +$$



$$)$$

QUESTION 3



Drag and drop the correct answer into the space(s) provided.

Write

$$m(x) = x^4 + 2x^3 - 2x^2 + 12x - 48$$

as the product of linear factors and an irreducible quadratic factor. The interval that contains all real zeros of the function is

$[-5, 3]$

.

Drag and drop the values into the boxes to complete the function.

$$m(x) = (x +$$

4



$$)(x -$$

2



$$)(x^2 +$$

6



)

3

1

8

QUESTION 4



Fill in the blank(s) with the correct answer.

Write a polynomial of least degree with real coefficients in standard form that has the zeros

$-4, 4,$ and $1 - i$

.

$$f(x) = x^4 -$$

2

 $x^3 -$

14

 $x^2 +$

32

 $x -$

32



QUESTION 5



Fill in the blank(s) with the correct answer.

The function

$$f(x) = x^4 - 8x^3 + 24x^2 - 32x - 65$$

has a zero at

$$2 + 3i$$

. What is the linear factorization of

$$f(x)$$

?

$$f(x) = (x$$

—

5



)(x +

1



)(x

—

2

—
 $3i)(x$
 —

(✓))

QUESTION 6



Fill in the blank(s) with the correct answer.

Find all zeros of

$f(x)$

given that

$2i$

is a zero.

$$f(x) = -3x^4 + 6x^3 + 12x^2 + 24x + 96$$

The positive real zero is

✓

The negative real zero is

✓

The complex zeros (not real) are

$2i$

and

✓

QUESTION 7



Fill in the blank(s) with the correct answer.

Write a polynomial of least degree with real coefficients in standard form that has the zeros $-3, 3$, and $2 + i$

$$f(x) = x^4 -$$



$$x^3 -$$



$$x^2 +$$



$$x -$$



QUESTION 8



Fill in the blank(s) with the correct answer.

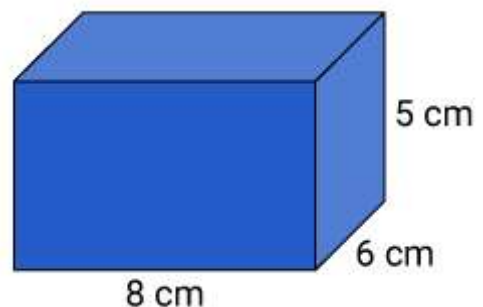
Jamal carved a small box that has a length of 8 cm, a width of 6 cm, and a height of 5 cm. He is going to increase the length, width, and height by the same number of centimeters for the next box he carves.

The equation for the volume of the new box is

$$V(x) = x^3 + 19x^2 + 118x + 240$$

and the volume of the new box is 1,848

cm³



What will be the length, width, and height of the new box Jamal carves?

The length will be ✓ cm, the width will be

✓ cm, and the height will be

✓ cm.

QUESTION 9



Fill in the blank(s) with the correct answer.

Write this function as a product of linear factors and an irreducible quadratic factor?

$$g(x) = x^4 + x^3 - 19x^2 + x - 20$$

$$g(x) = (x +$$

✓

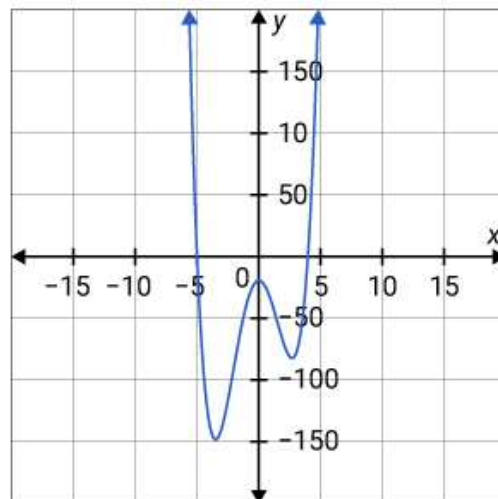
$$)(x -$$

✓

$$)(x^2 +$$

✓

$$)$$



QUESTION 10



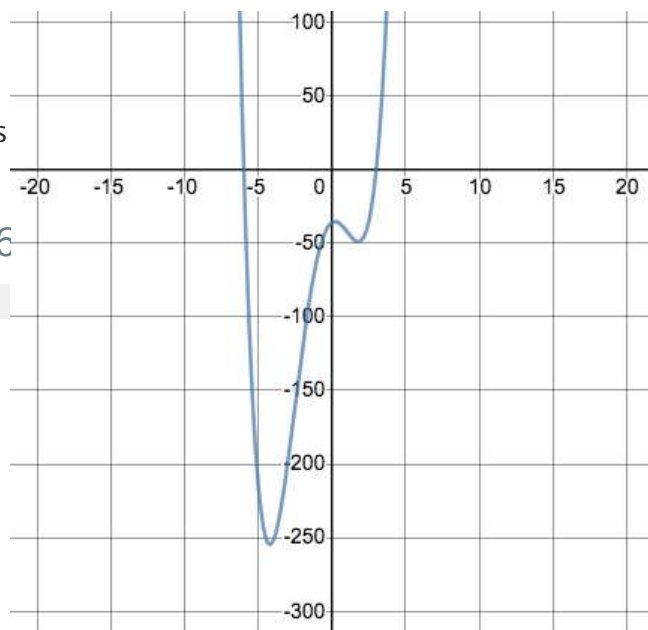
Choose the correct answer from the drop-down menu.

Write this function as a product of linear factors and an irreducible quadratic factor.

$$h(x) = x^4 + 3x^3 - 16x^2 + 6x - 36$$

$$h(x) =$$

$$(x + 6)(x - 3)(x^2 + 2) \quad \checkmark \quad \vee$$



QUESTION 11



Choose the correct answer from the drop-down menu.

Which polynomial has the zeros

$$1, 2, \text{ and } 5 - 6i$$

?

$$f(x) =$$

$$x^4 - 13x^3 + 93x^2 - 203x + 122 \quad \checkmark \quad \vee$$

QUESTION 12



Select the correct option.

Which function is equivalent to

$$f(x)$$

written as a product of linear factors and an irreducible quadratic factor?

$$f(x) = x^4 - 3x^3 - 12x - 16$$

☒ $f(x) = (x - 4)(x + 1)(x^2 + 4)$



☐ $f(x) = (x - 4)(x + 2)(x^2 + 2)$

☐ $f(x) = (x - 1)(x + 16)(x^2 + 1)$

☐ $f(x) = (x - 1)(x + 8)(x^2 + 2)$

QUESTION 13



Select the correct option.

Which polynomial function has the following zeros:

$$3, -2, \text{ and } 5 + i$$

?

☐ $f(x) = x^4 - x^3 + 19x^2 - 25x - 150$

☐ $f(x) = x^4 - x^3 - 42x^2 + 36x + 216$

☐ $f(x) = x^4 - x^3 - 31x^2 + 25x + 150$

☒ $f(x) = x^4 - 11x^3 + 30x^2 + 34x - 156$



QUESTION 14



The function

$$h(x) = x^4 - 7x^3 + 6x^2 + 68x - 120$$

has a zero at

$$4 - 2i$$

. What are the real zeros of

$$h(x)$$

?

☒ -3



☒ 2



 -2 

1

 -6 

3