



Name: Answer key

Precalculus
S1

Polynomials and Rationals

1. Write a polynomial function of minimum degree in standard form with zeros at -2 and $2i$.

$$y = (x+2)(x^2+4)$$

2. Write a polynomial of minimum degree in standard form with zeros at -1 with multiplicity 3, and 3 with multiplicity that has the following end behavior: As $x \rightarrow -\infty, y \rightarrow -\infty$.

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

3. Write a polynomial of minimal degree in standard form with real coefficients whose zeros are 1 and $\sqrt{3}$.

$$y = (x-1)(x^2-3)$$

4. Write a polynomial function of minimum degree in standard form with a negative leading coefficient whose zeros are 1 (multiplicity of 2) and -2 (multiplicity of 3).

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

5. Write a polynomial function of minimum degree in standard form with real coefficients whose zeros are -1 (multiplicity of 2) and $-2-i$ (multiplicity of 1).

$$y = (x+1)^2(x^2+4x+5)$$

6. State how many imaginary zeros and how many real zeros each function has using your graphing calculator.

A.) $f(x) = x^2 - 2x + 7$ 2 imaginary, no real

B.) $f(x) = x^4 - 2x^2 + 3x - 4$ 2 real, 2 imaginary

For #s 7 - 10, match the polynomial function with its graph WITHOUT using a calculator.

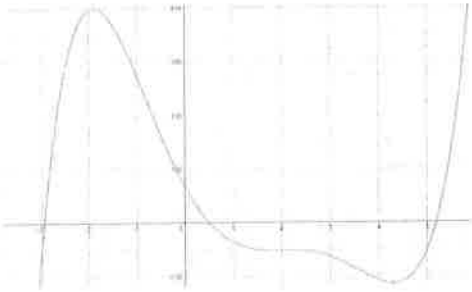
7. $f(x) = 7x^3 - 21x^2 - 91x + 104$

8. $f(x) = -9x^3 + 27x^2 + 54x - 73$

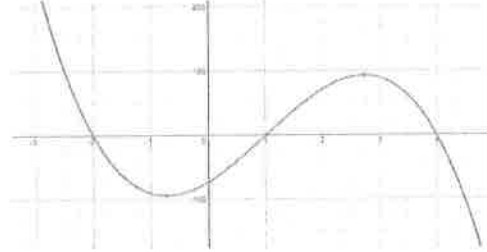
9. $f(x) = x^5 - 8x^4 + 9x^3 + 58x^2 - 164x + 69$

10. $f(x) = -x^5 + 3x^4 + 16x^3 - 2x^2 - 95x - 44$

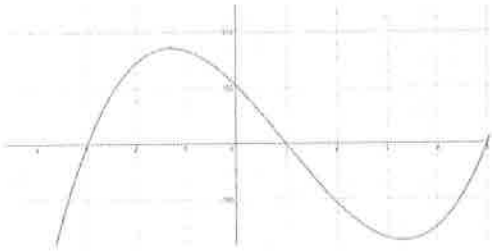
A.)



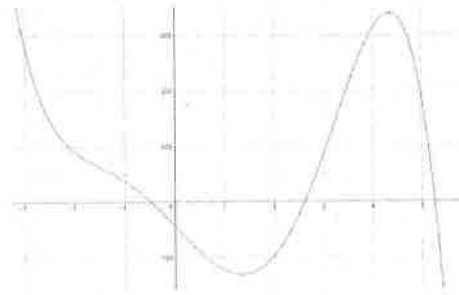
B.)



C.)



D.)

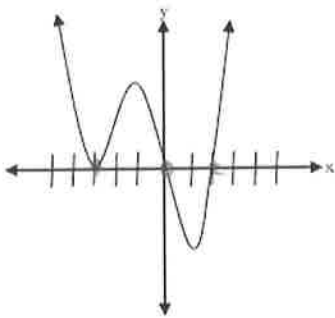


11. State each of the zeros and their corresponding multiplicity.

$$f(x) = (x - 2)^2(x + 2)^2(x + 3)^7$$

$x = 2$ multiplicity of 2
 $x = -2$ multiplicity of 2
 $x = -3$ multiplicity of 7

12. Write a function with minimum possible degree for the following polynomial graph.



$x = -3$
 $x = 0$
 $x = 2$

$$y = x(x - 3)^2(x - 2)$$