

**HW11:** Unit 1 Test Review #2

Rewrite each polynomial in standard form and state the degree.

1.  $2x + 4x^3 - 1$

2.  $7x^3 - 11x + x^5 - 2$

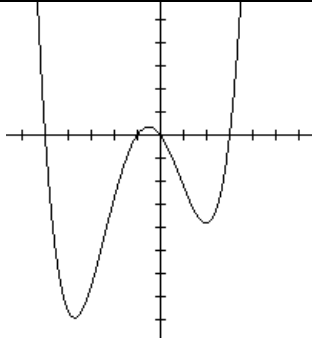
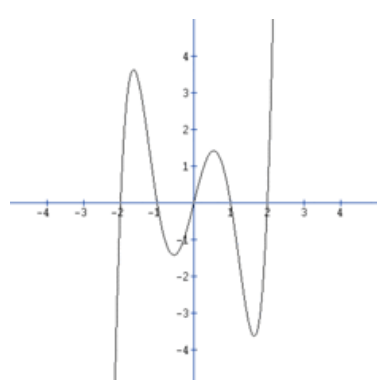
Factor.

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

4.  $8y^3 - 27$

5.  $2x^5 - 16x^2$

Complete the following table.

Graph	End Behavior	Odd or even degree	Number of real zeros
6. 			
7. 			

Perform the indicated operations. Write your answer in standard form.

8.  $(3x^2 + 7 + x) + (14x^3 + 2 + x^2 + x)$

9.  $(1 - x^2) - (3x^2 + 2x - 5)$

10.  $(x^2 + 3x - 5)(x^2 - x + 1)$

11.  $(x - 2)(1 + 3x - x^2)$

12.  $(6x^2 - 7x - 5) \div (3x - 5)$

13.  $(x^4 - 16x^2 + x + 4) \div (x + 4)$

Solve each polynomial function. Show all work.

14.  $3x^5 + 18x^4 + 27x^3 = 0$

15.  $9x^2 + 6x - 1 = 0$

16.  $x^3 - 2x^2 - 9x + 18 = 0$

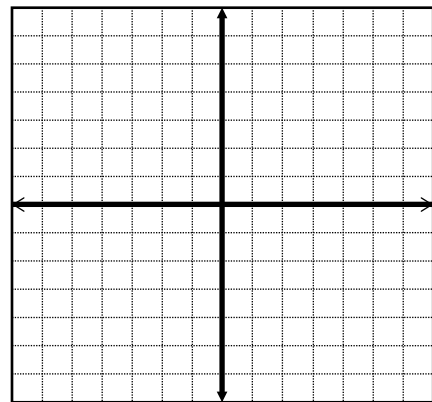
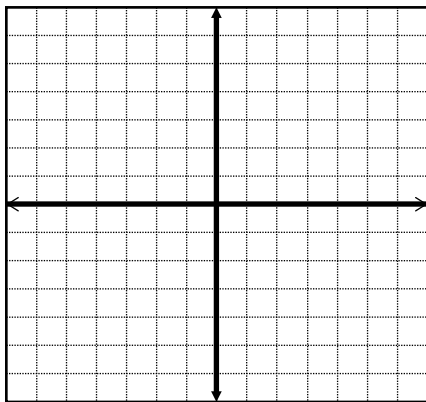
17.  $x^3 - 3x^2 = 0$

18. Melissa is building a storage box that is shaped like a rectangular prism. It will have a volume of 96 cubic feet. It has a width of  $w$ , a height of  $w - 2$ , and a length of  $w + 8$ . Find the dimensions of the box.

Graph the polynomials. Find the end behavior, zeros and y-intercepts.

19.  $f(x) = x^5 - 10x^3 + 9x$

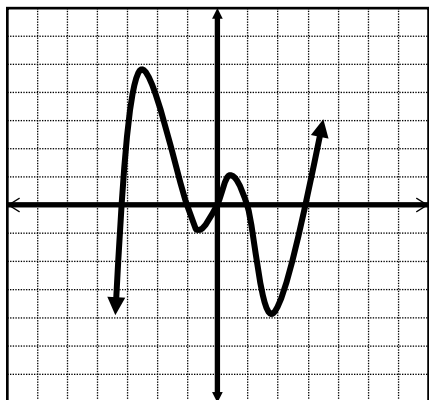
20.  $f(x) = -(x + 2)^2(x - 1)^2$



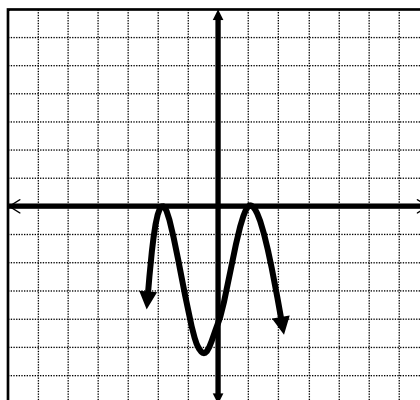
21. Write a polynomial function with zeros at 5, -2, 0 and the graph goes up to the left.

## Answers

- $4x^3 + 2x - 1$ ; 3<sup>rd</sup> degree
- $x^5 + 7x^3 - 11x - 2$ ; 5<sup>th</sup> degree
- $(x + 2)(x - 2)(x + 3)$
- $(2y - 3)(4y^2 + 6y + 9)$
- $2x^2(x - 2)(x^2 + 2x + 4)$
- End Behavior: both up  
Even Degree  
4 real zeros
- End Behavior: down left, up right  
Odd Degree  
5 real zeros
- $14x^3 + 4x^2 + 2x + 9$
- $-4x^2 - 2x + 6$
- $x^4 + 2x^3 - 7x^2 + 8x - 5$
- $-x^3 + 5x^2 - 5x - 2$
- $2x + 1$
- $x^3 - 4x^2 + 1$
- $x = -3, 0$
- $x = \frac{-1 \pm \sqrt{2}}{3}$
- $x = -3, 2, 3$
- $x = 0, 3$
- width = 4 ft, height = 2 ft, length = 12 ft
- End behavior: down left, up right  
Zeros: 0, -1, 1, -3, 3  
y-intercept: 0



- End behavior: both down  
Zeros: -2, 1  
y-intercept: -4



21.  $f(x) = -x(x - 5)(x + 2)$