

Honors Algebra II Chapter 5 Worksheet

1. Simplify

a)  $(4x^2y^{-3})^3$

$$\frac{64x^6}{y^9}$$

b)  $\frac{12x^3y^{-5}z^2}{3xy^2}$

$$\frac{4x^2z^2}{y^7}$$

c)  $\frac{7x^2y^5}{2z^{-3}} \frac{8x^3z^4}{y^2}$

$$28x^5y^3z^7$$

2. Describe the end behavior of the graphs using 'As x approaches  $\rightarrow \infty$ ' notation.

a)  $f(x) = -5x^3 - 8x^2 + 3,234x - 2$

As  $x \rightarrow \infty$ ,  $f(x) \rightarrow -\infty$

As  $x \rightarrow -\infty$ ,  $f(x) \rightarrow \infty$

b)  $h(x) = 8x^4 - 3x^2 + 9$

As  $x \rightarrow \infty$ ,  $f(x) \rightarrow \infty$

As  $x \rightarrow -\infty$ ,  $f(x) \rightarrow \infty$

3. Add, subtract or multiply the polynomials.

a)  $(3x^2 - 4x) - (8x - 3)$

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

b)  $(x - 3)(2x^2 - x + 3)$

$$x^3 - 7x^2 + 6x - 9$$

c)  $(x - 3)(2x + 1)(3x + 2)$

$$x^3 - 11x^2 - 19x - 6$$

d)  $(2x - 5)^3$

$$8x^3 - 60x^2 + 150x - 125$$

4. Factor.

a)  $x^3 + 8$

$$(x + 2)(x^2 - 2x + 4)$$

b)  $27x^3 - 343$

$$(3x - 7)(9x^2 + 21x + 49)$$

c)  $25x^3 - 100x^2 - x + 4$

$$(x - 4)(5x - 1)(5x + 1)$$

5. Divide  $(4x^4 + 5x - 4) \div (x^2 - 3x - 2)$  using long division.

$$4x^2 + 12x + 44 + \frac{161x + 84}{x^2 - 3x - 2}$$

6. Find all the zeros of  $f(x) = 3x^3 + 34x^2 + 72x - 64$ , given that one is -4.

$$x = -4, -8, \frac{2}{3}$$

7. Find all the possible rational zeros of  $f(x) = 8x^4 - 7x^3 + 2x^2 - 24$

$$x = \frac{\pm 1 \pm 2 \pm 3 \pm 4 \pm 6 \pm 8 \pm 12 \pm 24}{\pm 1 \pm 2 \pm 4 \pm 8}$$

8. Find all zeros of the following.

a)  $f(x) = x^4 - 81$

$x = 3, -3, 3i, -3i$

b)  $f(x) = x^3 - 6x^2 + 13x - 10$

$2, 2+2i, 2-2i$

c)  $f(x) = 2x^3 + 3x^2 + 50x + 75$

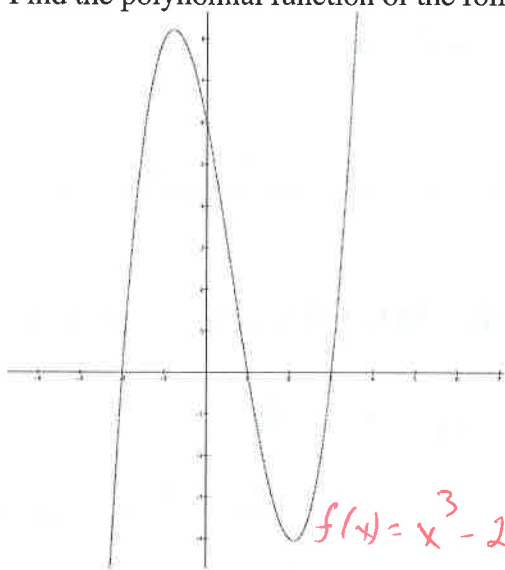
$-\frac{3}{2}, 5i, -5i$

d)  $f(x) = 2x^4 - x^3 + 7x^2 - 4x - 4$  e)  $f(x) = x^4 - 4x^3 + 8x^2 - 16x + 16$

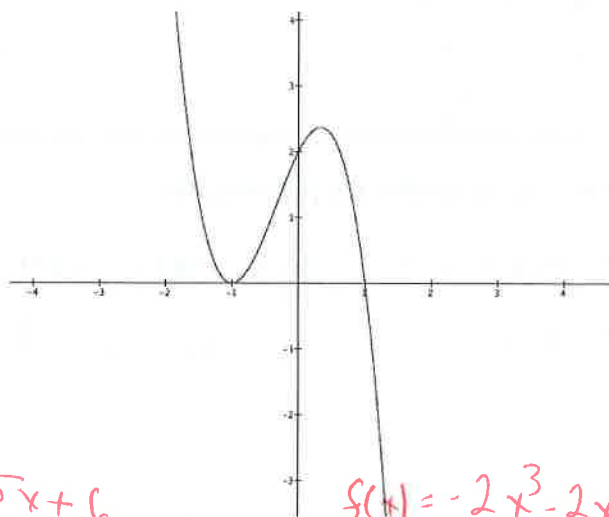
$1, -\frac{1}{2}, 2i, -2i$

$2, 2, 2, -2i$

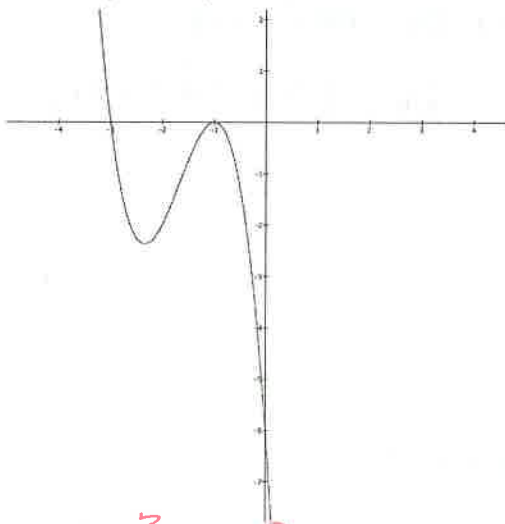
9. Find the polynomial function of the following graphs.



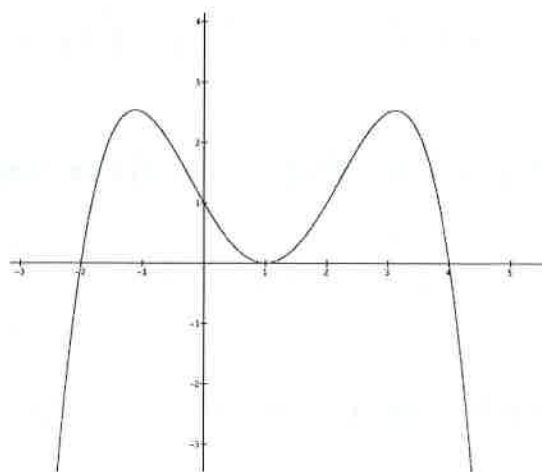
$f(x) = x^3 - 2x^2 - 5x + 6$



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



$f(x) = -2x^3 - 10x^2 - 14x - 6$



$f(x) = -\frac{1}{8}x^4 + \frac{1}{2}x^3 + \frac{3}{8}x^2 - \frac{7}{4}x + 1$

10. Write the polynomial function that has rational coefficients, a leading coefficient of 1 and the given zeros.

a)  $2, 4i$

$f(x) = x^3 - 2x^2 + 16x - 32$

b)  $-3, 2-i$

$f(x) = x^3 - x^2 - 7x + 15$

c)  $1, 2 + \sqrt{3}$

$f(x) = x^3 - 5x^2 + 5x - 1$