

Simplify the following.

Then put the resulting polynomial in descending order, state its degree and leading coefficient, and classify the polynomial by the number of terms.

1.  $(-5x + 7x^2 + 6x^3) - (-8x^2 + 14x^3 - 10x)$

$$-8x^3 + 15x^2 + 5x$$

Circle one of the following:

Monomial

Binomial

Trinomial

Polynomial

Degree: 3Leading Coefficient: -

2. State whether the following are polynomials in one variable. If they are not, explain why.

a.  $8x^2 + 9x - 17x^5$

yes

b.  $-12xy - 2x + 3y$

no

c.  $15x^{-3} + 11x^2 - 19$

no

d.  $6x^2 + \frac{1}{3}x - 7$

yes

3. Simplify the following:

a.  $(4 - 9i)^2$

$$-65 - 72i$$

b.  $-3(5 - 2i) + 4i(6i - 3)$

$$-39 - 6i$$

c.  $(8 - 5i) - (-4 + 2i)$

$$12 - 7i$$

d.  $(-2 + 7i)(6 - 13i)$

$$79 + 68i$$

4. Factor then solve.

a.  $y = x^2 - 3x - 108$

$$x = 12, x = -9$$

b.  $y = 12x^2 - 29x + 14$

$$x = \frac{2}{3}, x = \frac{7}{4}$$

5. Solve for the roots by using the quadratic formula.  $y = 3x^2 - 4x + 7$

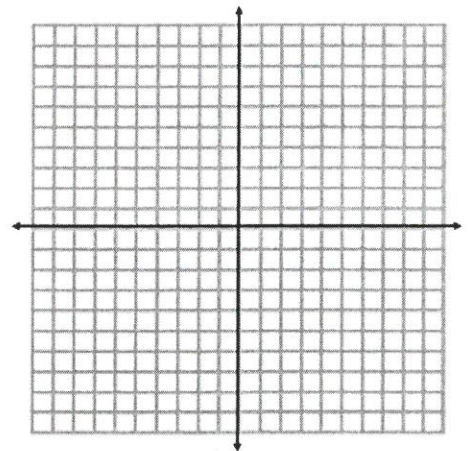
$$x = \frac{4 \pm 2i\sqrt{17}}{6} \text{ OR } x = \frac{2 \pm i\sqrt{17}}{3}$$

6.  $y = -16x^2 + 32x + 3$  represents the path of a softball as it leaves the bat and heads out to the outfield. How high does the ball get in the air?

19 ft.

7. Given:  $y = -(x - 3)(x + 2)$

- a. Is the equation above in standard, factored, or vertex form?
- b. List the x-intercepts.  $x = 3, x = -2$
- c. Give the coordinates of the vertex.  $(0.5, 6.25)$
- d. Name the y-intercept.  $(0, 6)$
- e. Sketch the graph



8. Sketch a polynomial given the degree and number of real roots. If the polynomial cannot be drawn, explain why.

- a. Degree 7, 3 real roots, LC -
- b. Degree 13, 6 real roots, LC +
- c. Degree 11, 9 real roots, LC +

