

# Polynomials Unit Test 1 Review Guide

Test Date: Friday, March 16, 2018

DO ALL WORK ON A SEPARATE SHEET OF PAPER

Find the product of the following polynomials. Write the product in standard form, classify the polynomial by degree/number of terms and describe the end behavior.

$$1) (x - 3)^2(x - 1) - 7x^2 + 15x - 9$$

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

$$4) x^2(x^4 - 16)$$

$$x^6 - 16x^2$$

$$2) -x^2(x + 2)^2 - x^4 - 4x^3 - 4x^2$$

Factor the following polynomials. HINT - Sometimes you only need to factor out a GCF and sometimes you need to factor completely.

$$5) 10x^3 - 3x \quad x(10x^2 - 3)$$

$$8) 3x^4 - 18x^3 + 24x^2 \quad 3x^2(x - 4)(x - 2)$$

$$9) x^3 - 9x \quad x(x + 3)(x - 3)$$

$$10) 12w^3 - 64w^2 + 80 \quad 4(3w - 10)(w - 2)$$

$$6) 3x^2y - 9xy^4 - 3xy(x - 3y^3) \quad 3xy^4(1 + 3x^2 + 3y^3)$$

$$7) 2x^2y + 4x^4y + 6x^6y \quad 2x^2y(1 + 2x^2 + 3x^4)$$

Determine the zeros of each polynomial. If there are any multiples list them with their multiplicity. Sketch a graph of the function.

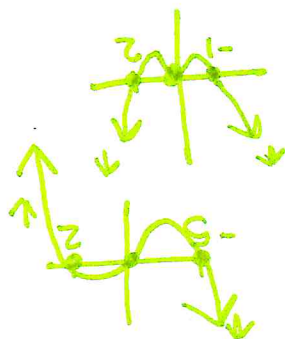
$$11) y = -(2x + 6)(x - 2)(x + 6)(x - 4) \quad x = -3, -2, 2, 4$$

$$13) y = (x - 3)^2(x + 1)^3 \quad x = 3, -1$$

$$15) y = x^2(x + 1)(x - 2)^3 \quad x = 0, -1, 2$$

$$12) y = -x(x - 2)(x + 5) \quad x = 0, 2, -5$$

$$17) y = x^3 - 6x^2 - 16x \quad x = 0, 8, -2$$



Use long division to find the quotient of the following polynomials.

$$18) (x^2 - 3x - 40) \div (x + 5) \quad (x - 8)$$

$$20) (x^3 + 3x^2 - x + 2) \div (x - 1) \quad x^2 + 4x + 3 + \frac{5}{x-1}$$

$$19) (3x^2 + 7x - 20) \div (x + 4) \quad (3x - 5)$$

$$21) (9x^3 - 18x^2 - x + 2) \div (3x + 1) \quad 3x^2 - 7x + 2$$

Determine whether each binomial is a factor of  $3x^3 + 10x^2 - x - 12$ . Explain your reasoning using complete sentences.

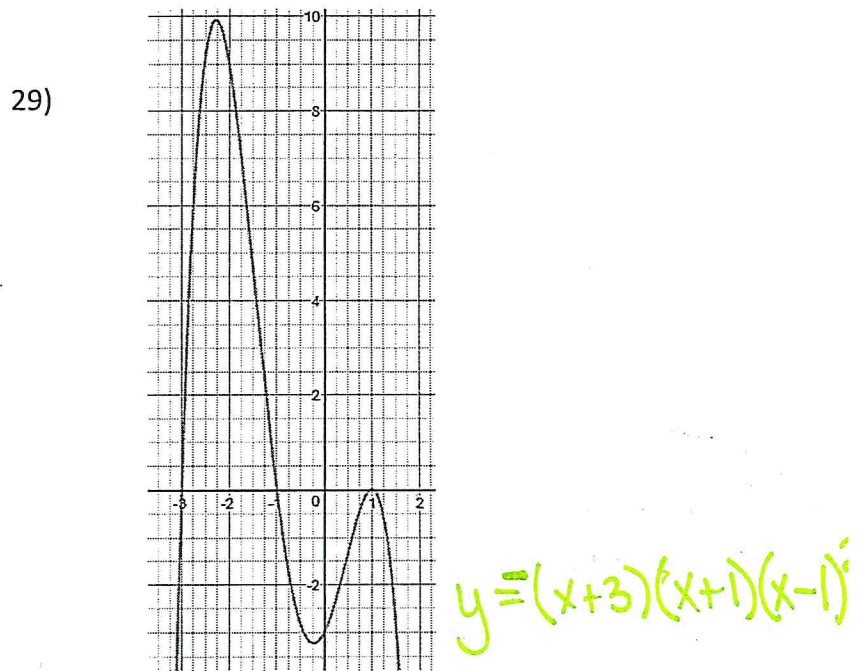
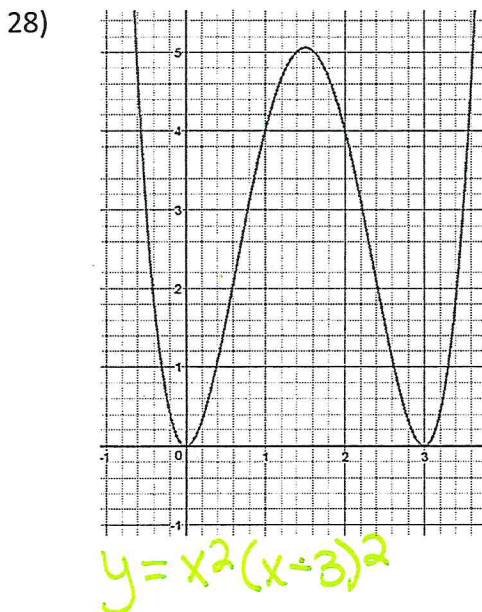
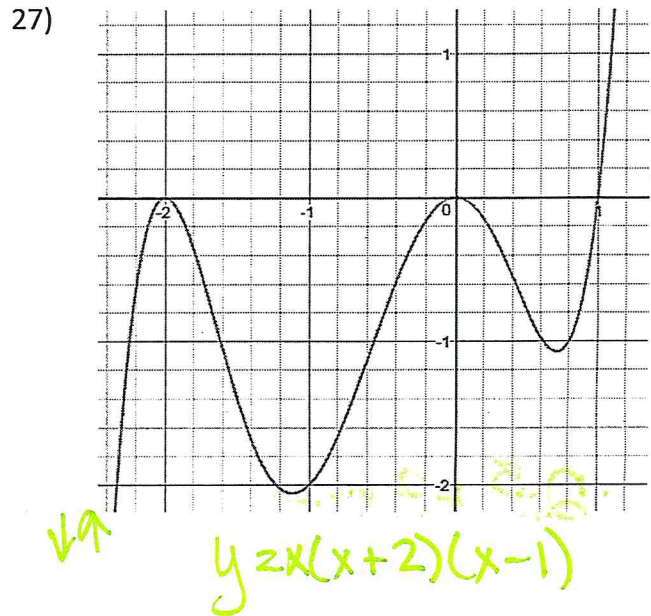
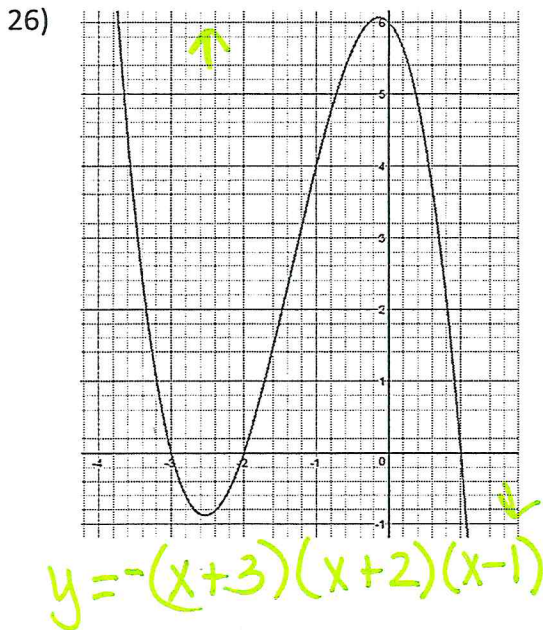
$$22) (x + 3) \quad \text{yes}$$

$$23) (x - 1) \quad \text{yes}$$

$$24) (x + 2) \quad \text{no}$$

$$25) (x - 4) \quad \text{no}$$

Write the equation in factored form of the given graph. Pay attention to multiplicities.



30) Based on the end behavior, match each function with its graph. Be able to explain how you made each decision.

