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Algebra 2 Review  
6.1-6.4

1. Rewrite in standard form. Identify the leading coefficient, degree of the polynomial, and the number of terms.

a) $5x + 4x^3 + 9 - x^2$	$4x^3 - x^2 + 5x + 9$	↓ 4	↓ 3	↓ 4 Terms
b) $2x^3 - 8 + 3x^5 + 6x^4 - 11x$	$3x^5 + 6x^4 + 2x^3 - 11x - 8$	↓ 5	↓ 5	↓ 5 Terms

2. Multiply. Write your answer in standard form.

a)  $(a-3)(a^2-5a+2)$   $a^3 - 5a^2 + 2a - 3a^2 + 15a - 6$   
 $a^3 - 8a^2 + 17a - 6$

b)  $2xy(4y^2 - xy + 3)$   $8xy^3 - 2x^2y^2 + 6xy$   
 $-2x^2y^2 + 8xy^3 + 6xy$

3. Multiply.  $(x-5)^3$   $(x-5)(x-5)(x-5)$   $(x-5)(x^2-10x+25)$   
 $x^3 - 10x^2 + 25x - 5x^2 + 50x - 125$   
 $x^3 - 15x^2 + 75x - 125$

4. Divide by using long division.

a)  $(-5x^2 + 6x - 10) \div (x + 7)$

$$\begin{array}{r} -5x + 41 + \frac{-297}{x+7} \\ x+7 \overline{) -5x^2 + 6x - 10} \\ (-) \underline{-5x^2 - 35x} \phantom{-10} \\ 41x - 10 \\ 41x + 287 \\ \underline{(-)} \phantom{-10} \\ -297 \end{array}$$

b)  $(y^4 + 10y^2 + 21) \div (y^2 + 3)$

$$\begin{array}{r} y^2 + 7 \\ y^2+3 \overline{) y^4 + 0y^3 + 10y^2 + 0y + 21} \\ (-) \underline{y^4 + 3y^2} \phantom{+ 0y + 21} \\ 7y^2 + 21 \\ 7y^2 + 21 \\ \underline{(-)} \phantom{+ 0y + 21} \\ 0 \end{array}$$

# Key Review 6.1-6.4 POSEZ

5. Divide by using synthetic division.

a)  $(8x^4 - 6x^2 + 4x + 6) \div (x - \frac{1}{2})$

$$\begin{array}{r|rrrrr} \frac{1}{2} & 8 & 0 & -6 & 4 & 6 \\ & & 4 & 2 & -2 & 1 \\ \hline & 8 & 4 & -4 & 2 & 7 \\ & & & 8x^3 + 4x^2 - 4x + 2 + \frac{7}{x-\frac{1}{2}} \end{array}$$

b)  $(7x^2 - 5x + 3) \div (x - 1)$

$$\begin{array}{r|rrr} 1 & 7 & -5 & 3 \\ & & 7 & 2 \\ \hline & 7 & 2 & 5 \\ & & & 7x + 2 + \frac{5}{x-1} \end{array}$$

6. Use synthetic substitution to evaluate the polynomial for the given value.

$P(x) = 5x^2 - 8x + 3$  for  $x = 4$

$$\begin{array}{r|rrr} 4 & 5 & -8 & 3 \\ & & 20 & 48 \\ \hline & 5 & 12 & 51 \end{array} \quad P(4) = 51$$

7. Use synthetic division to determine if the given binomial is a factor of  $P(x)$ .

$P(x) = x^3 - 2x^2 + 7x + 9$ ;  $x - 3$

$$\begin{array}{r|rrrr} 3 & 1 & -2 & 7 & 9 \\ & & 3 & 3 & 30 \\ \hline & 1 & 1 & 10 & 39 \end{array} \quad \underline{\text{No}}$$

8. Explain why  $15x^{\frac{1}{2}} + 4x$  is not a polynomial.

CAN'T have RATIONAL EXPONENTS (i.e.  $\frac{1}{2}$ )

9. Add or subtract. Write your answer in standard form.

a)  $(12x^3 - 5x^2 - 70x + 1) + (-17x^3 + 56x)$

$$\boxed{-5x^3 - 5x^2 - 14x + 1}$$

b)  $(6x^2 - 18x + 3) - (14x^2 - 12x + 9)$

$$\boxed{-8x^2 - 6x - 6}$$

10. Factor the trinomial.  $6x^2 + 21x + 9$

$$3(2x^2 + 7x + 3)$$

$$\boxed{3(2x+1)(x+3)}$$