SECONDARY MATH 3

**CORE STANDARDS**

A.APR.2

LESSON

**1-2**

OBJECTIVE **1.** I can apply the Remainder Theorem to determine the factors of a polynomial.

NOTES **Remainder Theorem:** For a polynomial $p(x)$ and a number a, the remainder when dividing by $x-a$ is $p\left(a\right)$, so $p\left(a\right)=0$ if and only if $x-a$ is a factor of $p(x)$.

In other words if we plug the number $a$ into the polynomial and get zero when simplified, then $x-a$ is a factor of the polynomial.

**Factoring review:** In order to factor a quadratic, $ax^{2}+bx+c$, when $a=1$ we select 2 numbers $p$ and $q$ , such that $p+q=b$ and $pq=c$. So the factored form is $(x+p)(x+q)$.

EXAMPLES

1. Is $x+5$ a factor of $f\left(x\right)=3x^{2}+14x-5$?
2. Is $x-3$ a factor of $f\left(x\right)=2x^{2}-7x-4$?
3. Is $x+2$ a factor of $f\left(x\right)=x^{3}-3x^{2}-6x+8$?

1. Factor: $f\left(x\right)=x^{2}-5x+6$
2. Factor: $f\left(x\right)=x^{2}+6x+9$
3. Factor: $f\left(x\right)=x^{2}+8x-20$

PRACTICE **1-2** NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 [SHOW YOUR WORK]

For the given polynomials determine which of the binomials listed are factors.

1. $f\left(x\right)=-2x^{2}+15x-7 $ 2. $f\left(x\right)=3x^{2}-7x-6$
	1. $x+1$ a. $x-3$
	2. $x-7$ b. $x+2$
	3. $x-2$ c. $x-2$
2. k
3. $f\left(x\right)=x^{3}+3x^{2}-4x-12$ 4. $f\left(x\right)=2x^{3}+15x^{2}-22x-15$
	1. $x+2$ a. $x+3$
	2. $x-2$ b. $x+5$
	3. $x+3$ c. $x-3$

Factor the following:

1. k
2. $x^{2}+8x+16$
3. $ x^{2}-4x$
4. $x^{2}+12x+35$
5. $x^{2}+5x-14$
6. $x^{2}+3x-4$
7. $x^{2}+11x+24$