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Date \_\_\_\_\_  
Algebra II

## Remainder Theorem

Find the remainder when  $p(x)$  is divided by  $g(x)$

1.  $p(x) = x^3 - 9x^2 + 21x - 5$

$g(x) = x - 5$

$p(5) = (5)^3 - 9(5)^2 + 21(5) - 5$

$p(5) = 0$

2.  $p(x) = x^4 - 8x^2 + 3x$

$g(x) = x + 4$

$p(-4) = (-4)^4 - 8(-4)^2 + 3(-4)$

$p(-4) = 116$

3.  $p(x) = x^3 - 2x^2 + 6x - 2$

$g(x) = x - 3$

$p(3) = (3)^3 - 2(3)^2 + 6(3) - 2$

$p(3) = 25$

4.  $p(x) = x^3 - 5x^2 - 5x + 25$

$g(x) = x + 2$

$p(-2) = (-2)^3 - 5(-2)^2 - 5(-2) + 25$

$p(-2) = 7$

5.  $p(x) = x^5 + 3x^4 - 4x^3 - 2x^2 + x - 3$

$g(x) = x + 9$

$p(-9) = (-9)^5 + 3(-9)^4 - 4(-9)^3 - 2(-9)^2 + (-9) - 3$

$p(-9) = -36624$

6.  $p(x) = -2x^4 - 3x^3 + 9x - 10$

$g(x) = x + 8$

$p(-8) = -2(-8)^4 - 3(-8)^3 + 9(-8) - 10$

$p(-8) = -6738$

7. What is the remainder when the following polynomial is divided by:

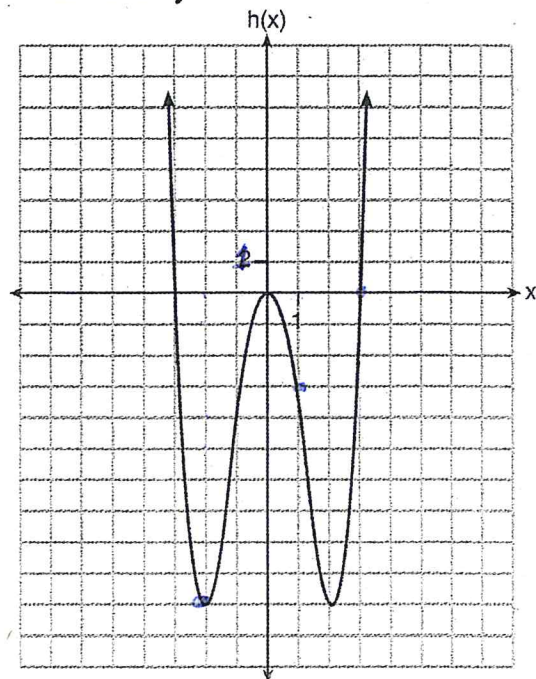
a)  $x - 1$

b)  $x + 2$

c)  $x - 3$

d)  $x$

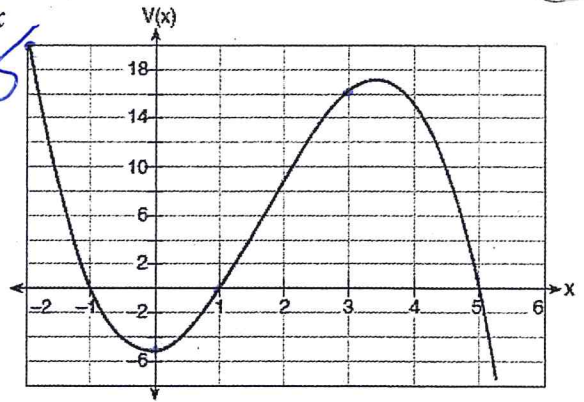
$p(1) = -3$     $p(-2) = -10$     $p(3) = 0$     $p(0) = 0$



8. What is the remainder when the following polynomial is divided by:

- a)  $x-3$       b)  $x+2$       c)  $x-5$       d)  $x-1$       e)  $x$

$p(3)=16$      $p(-2)=20$      $p(5)=0$      $p(1)=0$      $p(0)=5$

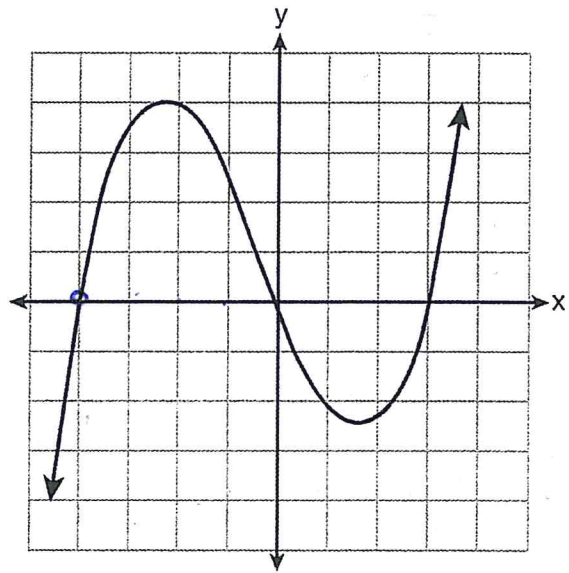


9. The graph of  $p(x)$  is shown below.

What is the remainder when  $p(x)$  is divided by  $x+4$ ?

- 1)  $x-4$   
 2)  $-4$   
 3)  $0$   
 4)  $4$

$p(-4)=0$



Find the remainder when the following polynomials are divided

10.  $\frac{x^3 + 2x^2 - 8x + 2}{x-3}$

$p(3) = (3)^3 + 2(3)^2 - 8(3) + 2$   
 $p(3) = 23$

11.  $\frac{3x^4 - 5x^3 - 2x - 6}{x+8}$

$p(-8) = 3(-8)^4 - 5(-8)^3 - 2(-8) - 6$   
 $p(-8) = 14858$

12.  $\frac{-x^3 + 4x^2 - 2x + 7}{x-5}$

$p(5) = -(5)^3 + 4(5)^2 - 2(5) + 7$   
 $p(5) = -28$

13.  $\frac{2x^5 - 6x^3 + 5x - 1}{x+2}$

$p(-2) = 2(-2)^5 - 6(-2)^3 + 5(-2) - 1$   
 $p(-2) = -27$