

2) Use synthetic division and the factor $(x - 3)$ to factor the polynomial $m(x) = 2x^3 + x^2 - 18x - 9$ completely.

a) Divide using synthetic division. Show your work below.

b) Write your quotient in polynomial form: _____

c) Factor your quotient from above. Show your work below.

d) Write $m(x)$ in its complete form: _____

2. Determine $P(-2)$, if $\frac{P(x)}{x+2} = x^3 - 4x^2 + 12x + 95$ R 47

$P(-2) = 47$. I know this because the Remainder Theorem tells me that the remainder I get from division is the same result as the value of the function if I substitute the root of the factor into the function, $P(x)$. Since they tell us that the remainder is 47, then we know that the answer for $P(-2)$ will equal 47 without having to actually do any work.

3) Using the same polynomial $m(x)$ from #2 above, answer the following:

a) There are two ways to find $m(2)$. One way is to substitute 2 for x into the polynomial function. What is the other way?

b) Find $m(2)$ using the method you identified in part a.