

1. Factor completely each of the following expressions...

[8]

a) $6x^3 + 5x^2 - 21x + 10$

b) $192x^{12} - 3y^6$

2. Divide:

$$(5x^5 - x^3 + 2x^2 - 4) \div (x^2 - 2)$$

[4]

3. Given that the binomial expression $(-x^4 + 2y^7)^{14}$ is expanded, determine the numerical coefficient of the term that would have the variable part $x^{36}y^{35}$. [3]

4. Determine the x -intercepts of the function... $f(x) = 8x^3 + 26x^2 + 13x - 5$ [5]

5. Expand the following using the binomial theorem: $(-3x^3 + 5y^5)^4$ [6]

6. Determine a polynomial equation that has the following roots: $x = -\frac{2}{5}, \frac{-2 \pm 3\sqrt{2}}{3}$ [5]

6. The polynomial $3x^3 + kx^2 - 2x + 4p$ is divisible by the binomial $x+1$, and when divided by the binomial $x+2$ the remainder is -40 . Determine the values of p and k .

[6]

7. Solve the following: $3^x(3^{x^3}) = 9^{2x^2-3}$

[4]