

CALCULATOR INACTIVE

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written work. You are advised to show all working.

1. Sketch the polynomial whose factored equation is $p(x) = -3(x + 1)^2(x - 3)(2x - 4)$. Make sure your y-intercept has been calculated and is labeled in your sketch. (6)

2. Given that $x = -3$ is a zero of $f(x) = 3x^3 + x^2 - 20x + 12$, find all three factors and all three zeroes of $f(x)$. (6)

CALCULATOR ACTIVE

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. In particular, solutions found from a graphic display calculator should be supported by suitable working, e.g. if graphs are used to find a solution, you should sketch these as part of your answer. Where an answer is incorrect, some marks may be given for correct method, provided this is shown by written work. You are therefore advised to show all working.

1. Given the polynomial $g(x) = x^4 + 2x^3 - 8x^2 - 14x$, determine:
 - a. The domain interval in which the function values are increasing, (2)
 - b. The domain interval in which $g(x) < 0$. (2)
 - c. Include a sketch of the polynomial. (3)

2. Given the rational function $R(x) = \frac{8x - 15}{4x - 10}$, sketch the function. Make sure your sketch shows the horizontal and vertical asymptotes and their equations as well as the x- and y-intercepts. (5)