The Math Dugout - Worksheet

CRITICAL POINTS

The Double Derivative Test

Useful Videos - https://youtu.be/YUS6TA5ZBko

EXERCISE 1 – Find ALL critical points of the following functions by stating their exact coordinates and determine the nature of the critical point by using the double derivative test.

(a) $f(x) = 3x^2$

(b) $g(x) = \frac{x^3}{3} + 5x^2 + 21x + 20$

(c) $f(x) = \frac{x^4}{4} + 3x^3 + 9x^2$

(d) $g(x) = \frac{x^3}{3} + \frac{5x^2}{2} + 6x$

Exercise 2 – Garry the gold digger is being lowered into a gold mine. His height above ground level in metres (H) can be modelled as a function of time in minutes (t) below…

$$H(t) = \frac{x^3}{3} + \frac{3x^2}{2} - 28x$$

(a) Is Garry on the ground to begin with?

(b) After how many minutes is Garry at his deepest point into the gold mine?

(c) Using your answer from above, state the greatest depth below ground level Garry went. (Give your answer to the nearest centimetre).