Nugraha Adhitama
XI MIPA 3

: y = 5

1.) DIK : $y = x^3 - 3x^2 + 5x - 10$ Jawab :

DIT : PGS ?

$y' = 3x^2 - 6x + 5$ ~~$+ 0$~~ .... (1)

$y = x^3 - 3x^2 + 5x - 10$

$5 = x^3 - 3x^2 + 5x - 10$

$0 = x^3 - 3x^2 + 5x - 15$

$0 = (x - 3)(x^2 + 5)$

$x = 3$ → masukkan ke persamaan (1)

$y' = 3(3)^2 - 6(3) + 5$

$= 27 - 18 + 5$

$m = y' = 14$

PGS : $y - y_1 = m(x - x_1)$

$y - 5 = 14(x - 3)$

$y = 14x - 37$

2.) $m = y' = 2x + 10$

$m = y' = 2(1) + 10$

$m = y' = 12$

$y = x^2 + 10x + 7$

$y = (1)^2 + 10(1) + 7$

$y = 18$

titik singgung $(1, 18)$

$y - y_1 = m(x - x_1)$

$y - 18 = 12(x - 1)$

$y = 12x + 6$

$y = ax^3 + b$

$54 = a(4)^3 + b$

$54 = 64a + b \quad \ldots (2)$

$m = y' = 3ax^2 + b$

$12 = 3ax^2 + b$

$y = 12x + 6$

$y = 12(4) + 6$

$y = 54$

titik singgung $= (4, 54)$

$12 = 3a(4)^2 + b$

$12 = 48a + b \quad \ldots (1)$

eliminasi persamaan (1) & (2)

$54 = 64a + b$

$12 = 48a + b$ $-$

$42 = 16a$

$\frac{42}{16} = a$

$\frac{21}{8} = a$

$12 = 48\left(\frac{21}{8}\right) + b$

$12 = 126 + b$

$-114 = b$

3.) $F(x) = \frac{1}{3}x^3 - \frac{3}{2}x^2 - 4x + 5$

$F'(x) = x^2 - 3x - 4$

$(x-4)(x+1)$

$x = 4 \quad x = -1$

Titik uji coba : 0

$0^2 - 3(0) - 4$

$= -4$

- Fungsi naik $\rightarrow x < -1$ atau $x > 4$
- Fungsi turun $\rightarrow -1 < x < 4$

4.) $F(x) = 2x^3 - 9x^2 + 12x$

$F'(x) = 6x^2 - 18x + 12$

$= x^2 - 3x + 2$

$(x-1)(x-2)$

$x = 1 \quad x = 2$

- $x = 1 \rightarrow 2(1)^3 - 9(1)^2 + 12(1)$

  $2 - 9 + 12 = 5$ (1, 5)

- $x = 2 \rightarrow 2(2)^3 - 9(2)^2 + 12(2)$

  $16 - 36 + 24 = 4$ (2, 4)

5.) $F(x) = ax^3 + bx^2$ Titik (1, -1)

dit : a & b ?

$y = ax^3 + bx^2$

$-1 = a(1)^3 + b(1)^2$

$-1 = a + b$

$y' = 3ax^2 + 2bx$

$y' = 3a(1)^2 + 2b(1)$

$0 = 3a + 2b$

$-2b = 3a$

$a = \frac{-2b}{3}$

$-1 = \frac{-2b}{3} + b$

$-3 = -2b + 3b$

$-3 = b$

$a = \frac{-2(-3)}{3}$

$-1 = a - 3$

$a = 2$