

1.) Tent. titik belok dari $y = x^3 - 3x^2 - 24x$

$$y' = 3x^2 - 6x - 24$$

$$y' = 6x - 6$$

$$y'' = 0$$

$$6x - 6 = 0$$

$$6x = 6$$

$$x = 1$$

$$1 - 3 - 24 = -26$$

$$\text{Titik } (1, -26)$$

2.) Tent. $f''(x)$: a.) $x(x^2 + 1)^3 \rightarrow x^7 + 3x^5 + 3x^3 + x \rightarrow f' = 7x^6 + 15x^4 + 9x^2 + 1$
 b.) $x^3 - \frac{1}{2x}$
 $f'' = 42x^5 + 60x^3 + 18x$

$$c.) f' = \frac{3x^4 + 1}{x^2}$$

$$f'' = 3x^2 + \frac{1}{x^2}$$

$$\frac{6x^4 - 2x}{x^3}$$

3.) $f(x) = \sqrt{(x^3 - 3)}$, Tentukan $f''(x)$

4.) $y = Ax^3 + Bx^2$, Dengan A dan B konstan. Jika nilai stasioner di $x = 1$ adalah -
 tentukan nilai dari $2A - 3B$

5.) Kurva $y = 3 - x^2$ tegak lurus terhadap $5y = x + 2$

5.) Tent. PGS kurva $y = 3 - u^2$ tegak lurus terhadap $y =$

6.) Tent. PGS dari PGS pada kurva $y = 3u^2 - 2u + 5$

7.) Grafik $y = 2u^3 - \frac{3}{2}u^2 - 5u + 2$ naik pada u

Jawab :

3.) $f' = \frac{1}{6\sqrt[6]{u^4 \times (u^2 - 3)^3}}$

~~4.) stasioner dititik (1,3)~~

~~5.) $y = Au^3 + Bu^2$~~

~~$y' = 3Au^2 + 2Bu$~~

~~$0 = 3A(1)^2 + 2B$~~

$$5.) y = 3 - x^2 \perp 5y = x + 7$$

$$\left(\begin{array}{l} y = \frac{x+7}{5} \quad m_2 = \frac{1}{5} \end{array} \right. \quad \text{---}$$

$$y = 3 - x^2$$

$$y' = -2x$$

$$m_1 = -2x$$

$$m_1 \cdot m_2 = -1$$

$$m_1 \cdot \frac{1}{5} = -1$$

$$m_1 = -5$$

$$-5 = -2x$$

$$2.5 = x$$

$$y = 3 - (2.5)^2$$

$$y = 6.25$$

$$(2.5, -3.25)$$

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

$$y + 3.25 = -5(x - 2.5)$$

$$\boxed{y = -5x + 9.25}$$

$$4.) f(x) = Ax^3 + Bx^2$$

$$f'(1) = 3Ax^2 + 2Bx$$

$$3A + 2B = 0$$

$$6.) \text{ordinat} = -2$$

$$3x^2 - 7x + 5 = -2$$

$$3x^2 - 7x + 7 = 0$$

$$\rightarrow x \notin \mathbb{R}$$

$$3A + 3B = 9$$

$$3A + 2B = 0$$

$$B = 9$$

$$A + B = -3$$

$$A + 9 = -3$$

$$A = -12$$

$$2A + 3B$$

$$= 2(-12) + 3(9)$$

$$= 3$$

$$7.) y = 2x^3 - \frac{3}{2}x^2 - 5x + 2, \text{ naik pada } x = ?$$

$$y' = 6x^2 - 3x - 5$$

$$y' > 0 \rightarrow 6x^2 - 3x - 5 > 0$$

$$x_1 = \frac{3 - \sqrt{129}}{12} \quad x_2 = \frac{3 + \sqrt{129}}{12}$$