

مربوط به تلفیق شماره‌ی ۲۸ نمی باشد!

سوال ۱

سوال ۲

$$f(x) = \frac{a}{2x-1} \quad m = \frac{-12-4}{-0.5-2.5} = \frac{+18}{-3} = 4$$

سوال ۳

$$\begin{matrix} (2.5, 4) \\ (-0.5, -12) \end{matrix} \quad \text{خط مماس} = y - 4 = 4(x - 2.5) \Rightarrow y = 4x + 9$$

$$f(x) = \frac{a}{2x-1} = 4x - 9 \Rightarrow a = (4x - 9)(2x - 1) \Rightarrow a = 12x^2 - 26x + 9$$

$$12x^2 - 26x + 9 - a = 0 \Rightarrow \Delta = 0 \Rightarrow a = -9 \Rightarrow f(x) = \frac{-9}{2x-1} \Rightarrow f(x) = f(5)$$

$$f(5) = -\frac{1}{1/2}$$

سوال ۴

$$y = 2x + b \Rightarrow y' = 2$$

$$x = 1$$

$$y = \frac{x+a}{ax+1} \Rightarrow y' = \frac{(ax+1) \cdot 1 - a(x+a)}{(ax+1)^2} = \frac{1-a^2}{(ax+1)^2}$$

$$y'(1) = \frac{1-a^2}{(a+1)^2} = 2 \Rightarrow 2(a+1)^2 = (1-a)^2 \Rightarrow 2(a^2 + 2a + 1) = (1-a)^2 \Rightarrow$$

$$2a^2 + 4a + 2 = 1 - 2a + a^2 \Rightarrow (a+1)(2a+1) = 0 \quad \left\{ \begin{array}{l} a = -1 \Rightarrow y = -1 \\ a = -1/2 \end{array} \right.$$

$$a = -1/2 \Rightarrow y = \frac{x - 1/2}{1/2x + 1} = \frac{2x - 1}{-x + 2} \xrightarrow{x=1} y = 1$$

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

$$A(1, 1) \Rightarrow y = 2x + b \Rightarrow 1 = 2 + b \Rightarrow b = -1$$

$$\sin x + \frac{1}{r} \cos x = \frac{r}{r} \sin x \Rightarrow \sin n = \cos n \Rightarrow n = \frac{\pi}{2}$$

سؤال ٥

$$A \left( \frac{\pi}{2}, \frac{\sqrt{r}}{2} \right) \Rightarrow f(x) = \cos n - \frac{1}{r} \sin x \rightarrow \boxed{f' \left( \frac{\pi}{2} \right) = \frac{\sqrt{r}}{2}}$$

$$y - \frac{r\sqrt{r}}{2} = \frac{\sqrt{r}}{2} \left( x - \frac{\pi}{2} \right) \rightsquigarrow y = 0 \Rightarrow n = \frac{\pi}{2} - r$$

$$f(x) = rx^3 - 3x^2 - rx + 1$$

سؤال ٤

$$\begin{cases} f'(x) = 4x^2 - 4x - r = 0 \rightarrow x^2 - x - r = 0 \Rightarrow \begin{cases} x_1 = -1 \Rightarrow y_1 = 8 \\ x_2 = 2 \Rightarrow y_2 = -19 \end{cases} \end{cases}$$

$$A(-1, 8) \Rightarrow \frac{0}{-1} = \frac{8 + 19}{-1 - 2} = -9$$

$$B(2, -19)$$

$$\Rightarrow 4x^2 - 4x - r = -9 \Rightarrow 4x^2 - 4x - r = 0 \rightsquigarrow \Delta > 0 \rightsquigarrow \text{أصواب ثابت}$$

نقطة

$$y = \frac{k}{r} x^3 - (k+r)x^2$$

سؤال ٧

$$y' = \frac{3}{r} k x^2 - 2(k+r)x$$

$$y'' = \frac{6}{r} k x - 2(k+r) \Rightarrow y'' = 0 \Rightarrow x = \frac{r(k+r)}{3k}$$

$$f \left( \frac{r(k+r)}{3k} \right) = \frac{k}{r} \left( \frac{r}{3k} \right)^3 x \frac{(k+r)^3}{k^3} - (k+r) \left( \frac{r}{3k} \right)^2 x \frac{(k+r)^2}{k^2} = \frac{-\Delta (k+r)^3}{3\sqrt{3}k^2}$$

$$\frac{1}{\sqrt{3}} \left( \frac{r(k+r)}{3k}, \frac{-\Delta (k+r)^3}{3\sqrt{3}k^2} \right) \xrightarrow{\text{نقطة}} \begin{matrix} x_A < 0 \\ y_A < 0 \end{matrix}$$

$$\frac{r(k+r)}{3k} < 0 \rightarrow -r < k < 0 \quad (1)$$

$$\frac{-\Delta (k+r)^3}{3\sqrt{3}k^2} < 0 \rightarrow k+r > 0 \rightarrow k > -r \quad (2)$$

$$(1) \cap (2) \quad k \in (-r, 0)$$

