of 33

The function $f(x) = \log_7 x + 2$ is continuous on

(a) $(0, \infty)$ (b) $\{2\}$ (c) $\mathbb{R} - \{2\}$ (d) $\mathbb{R}$

- a
- b
- c
- d

منصفح الأسئلة

The domain of the function $f(x) = |x^2 + 2x + \sqrt{3}|$ is

(a) $\mathbb{R}$

(b) $\mathbb{R} - \{0\}$

(c) $[0, \infty)$

(d) $(-\infty, 0]$

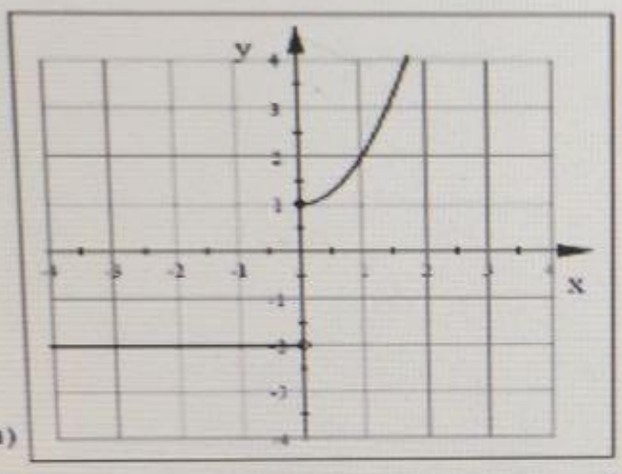
If $f(x) = 3e^{3x}$, then $f''(0) =$

(a) 3 (b) 9 (c) 27 (d) 0

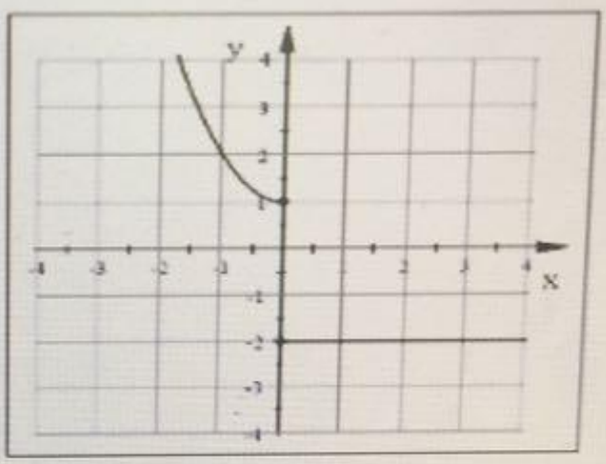
- a
- b
- c
- d

The graph of the function $g(x) = \begin{cases} x^2 + 1 & \text{if } x \geq 0 \\ -2 & \text{if } x < 0 \end{cases}$ is

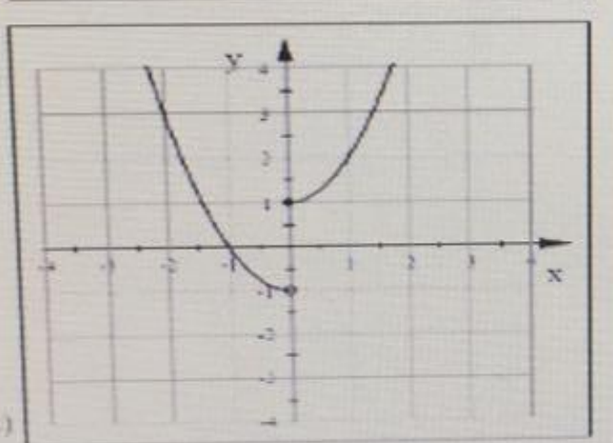
(a)



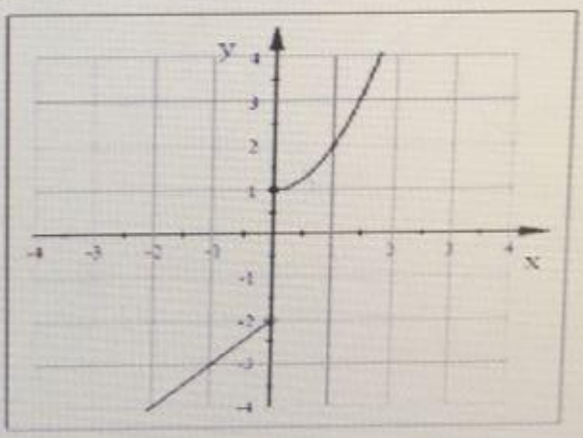
(b)



(c)



(d)



- a
- b

If $y = \ln \frac{1}{x^{-6}}$, then $y' =$

(a) $-6x^{-2}$

(b) $-6x^{-1}$

(c) $6x^{-1}$

(d) $6x^{-2}$

The graph of $y = x^2 + 4x + 10$ has a horizontal tangent at $x =$

(a) -4

(b) -2

(c) 2

(d) 4

$$\tan(x + \frac{\pi}{2}) = \tan x \text{ is}$$

(a) True

(b) False

$$\tan(x + \frac{\pi}{2}) = \tan x \text{ is}$$

(a) True

(b) False

The interval of increasing for the function $f(x) = 2x^2 - 2$ is

$(a)\ \mathbb{R}$

$(b)\ (0, \infty)$

$(c)\ (-\infty, 0)$

$(d)\ \mathbb{R} - \{1\}$

- (a)
- (b)
- (c)
- (d)

$$\lim_{x \to -1} (x^2 - 3x + 1) =$$

(a) -1

(b) 1

(c) 5

(d) -3

If $f(x) = 1$ and $g(x) = x + 3$ then $(f \circ g)(6) =$

(a) 9

(b) 7

(c) 1

(d) 4

The critical number of the function $f(x) = 3x^2 + 8x - 6$ is $c =$

(a) $\frac{4}{3}$

(b) $\frac{-3}{4}$

(c) $\frac{-4}{3}$

(d) $\frac{3}{4}$

$f(\theta) = \cos(7\theta)$, then $f'\left(\frac{\pi}{7}\right) =$

) 0 (b) 1 (c) -1 (d) ∞

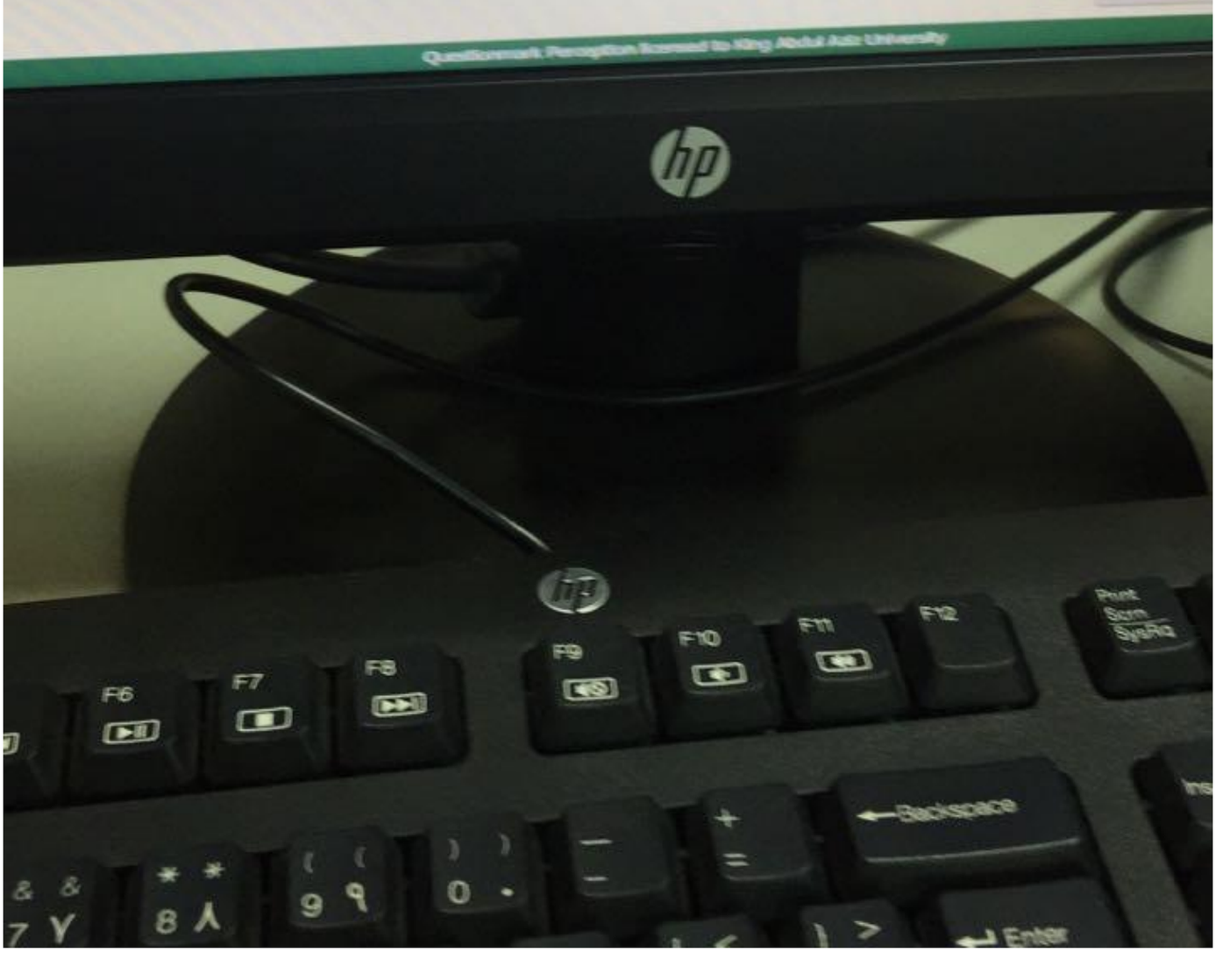
If $y = x^{7x}$,then $y' =$

(a) $-7x^{7x}(1 + \ln x)$

(b) $7x^{7x}(1 + \ln x)$

(c) $x^{7x}(1 + \ln x)$

(d) $7x^{7x}(1 - \ln x)$



The inverse function of the function $f(x) = \ln(5x - 4)$ is

(a) $f^{-1}(x) = \frac{1}{5}(e^x + 4)$

(b) $f^{-1}(x) = \frac{1}{5}(e^x - 4)$

(c) $f^{-1}(x) = \frac{1}{4}(e^x + 5)$

(d) $f^{-1}(x) = \frac{1}{4}(e^x - 5)$

- (a)
- (b)
- (c)
- (d)

The domain of the function $f(x) = \sqrt{x} + 3$ is

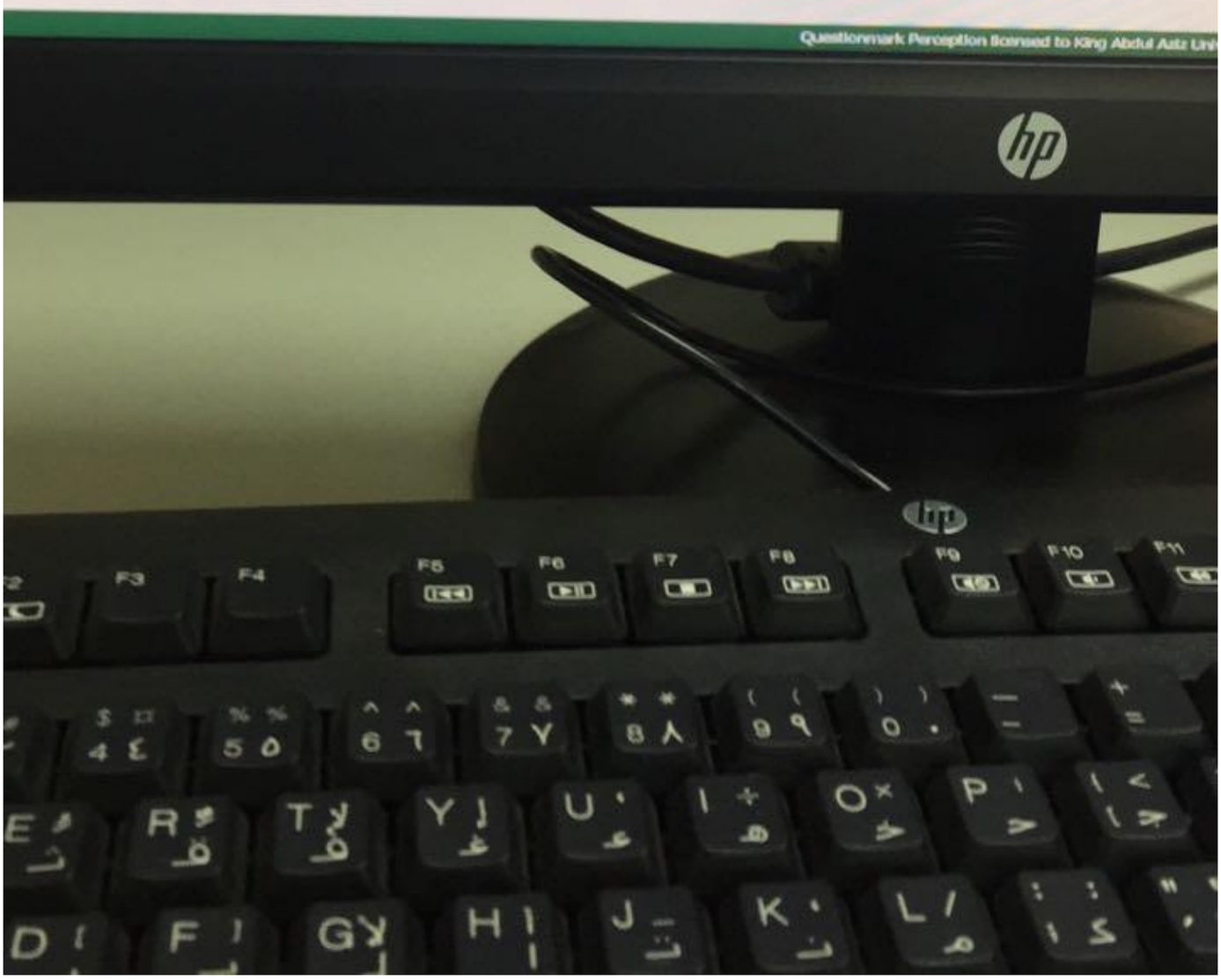
(a) $[-3, \infty)$

(b) $[3, \infty)$

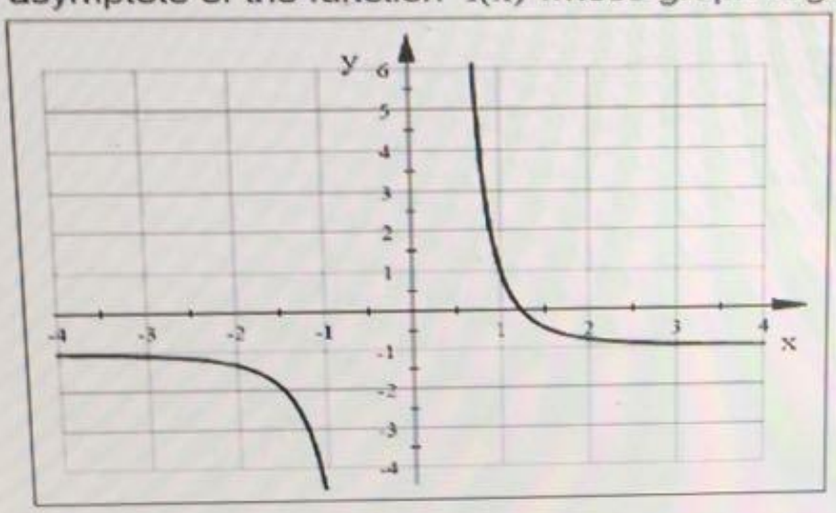
(c) $\mathbb{R}$

(d) $[0, \infty)$

- a
- b
- c
- d



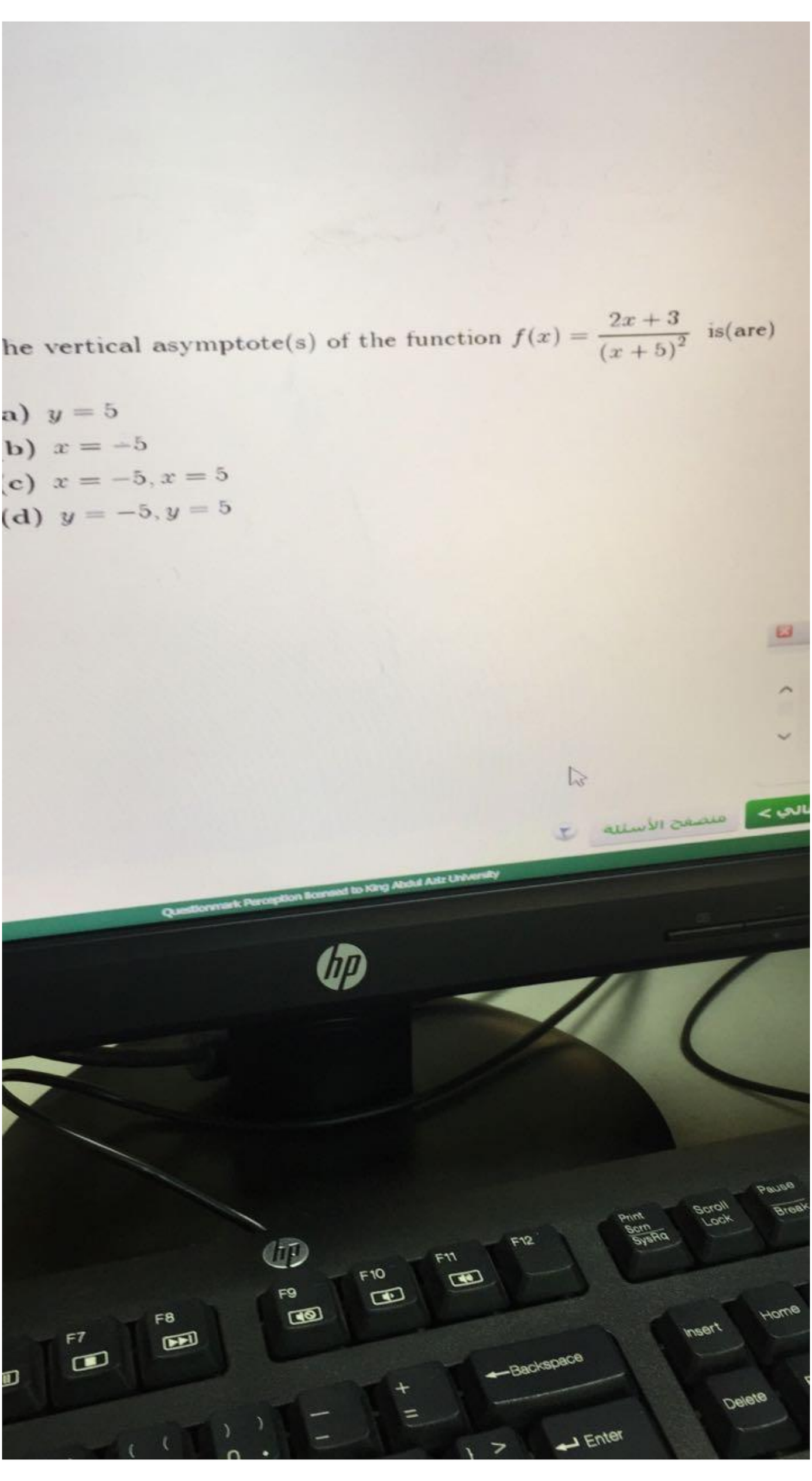
e horizontal asymptote of the function $f(x)$ whose graph is given is $y = -1$.



True
False

he vertical asymptote(s) of the function $f(x) = \dfrac{2x+3}{(x+5)^2}$ is(are)

a) $y = 5$
b) $x = -5$
c) $x = -5, x = 5$
d) $y = -5, y = 5$



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$$\lim_{x \to 1} \frac{\cos x - 1}{x} = 1$$

- True
- False

rect answer:

The function $f(x) = -x^2 - 2x$ has

(a) an inflection point at $x = -1$

(b) an inflection point at $x = 0$

(c) no inflection points

(d) an inflection point at $x = 1$

The domain of the function $f(x) = |x^2 + 2x + \sqrt{3}|$ is

(a) $\mathbb{R}$

(b) $\mathbb{R} - \{0\}$

(c) $[0, \infty)$

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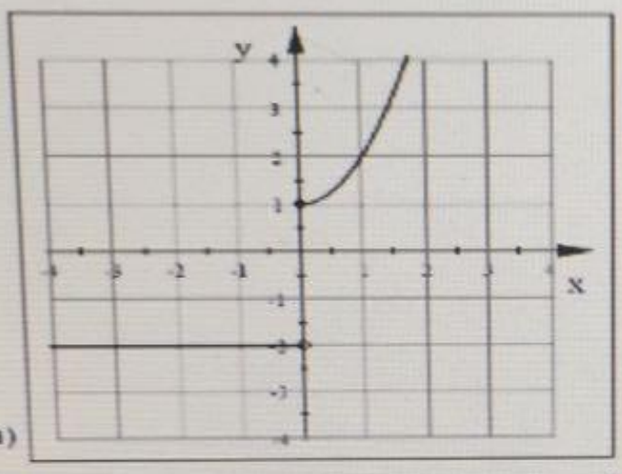
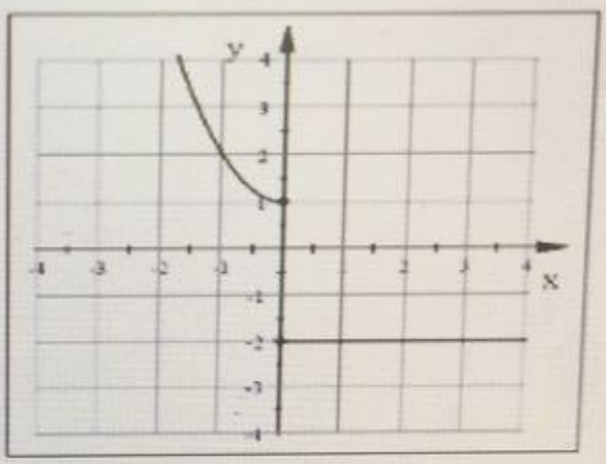
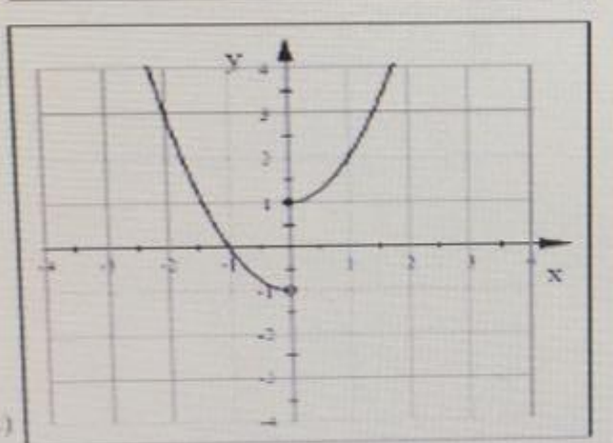
(a)



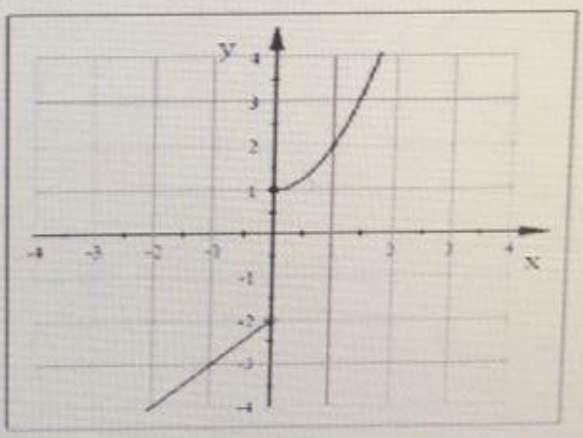
(b)



(c)



(d)



- a
- b

The graph of $y = x^2 + 4x + 10$ has a horizontal tangent at $x =$

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(b) -2

(c) 2

(d) 4

$$\tan(x + \frac{\pi}{2}) = \tan x \text{ is}$$

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$(b)\ (0, \infty)$

$(c)\ (-\infty, 0)$

$(d)\ \mathbb{R} - \{1\}$

- (a)
- (b)
- (c)
- (d)

$$\tan(x + \frac{\pi}{2}) = \tan x \text{ is}$$

(a) True

(b) False

$$\lim_{x \to -1} (x^2 - 3x + 1) =$$

(a) -1

(b) 1

(c) 5

(d) -3

$f(\theta) = \cos(7\theta)$, then $f'\left(\frac{\pi}{7}\right) =$

) 0 (b) 1 (c) -1 (d) ∞

The critical number of the function $f(x) = 3x^2 + 8x - 6$ is $c =$

(a) $\frac{4}{3}$

(b) $\frac{-3}{4}$

(c) $\frac{-4}{3}$

(d) $\frac{3}{4}$

If $f(x) = 1$ and $g(x) = x + 3$ then $(f \circ g)(6) =$

(a) 9

(b) 7

(c) 1

(d) 4

The graph of the function $f(x) = -2x^2 + 9$ is

(a) concave-up on $\mathbb{R}$

(b) not concave

(c) concave-up and concave-down on $\mathbb{R}$

(d) concave-down on $\mathbb{R}$

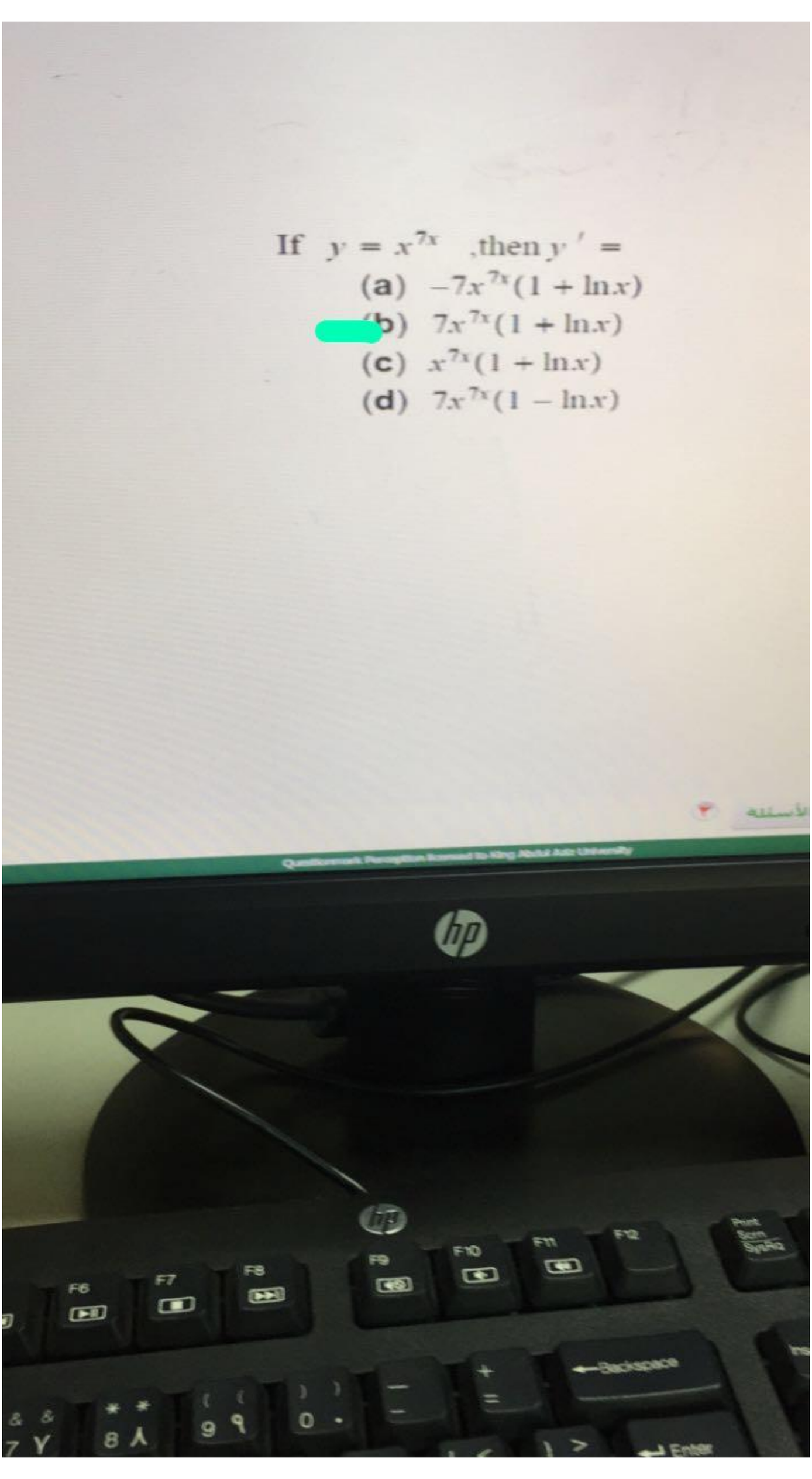
If $y = x^{7x}$,then $y' =$

(a) $-7x^{7x}(1 + \ln x)$

(b) $7x^{7x}(1 + \ln x)$

(c) $x^{7x}(1 + \ln x)$

(d) $7x^{7x}(1 - \ln x)$



If $f(x) = 1$ and $g(x) = x + 3$ then $(f \circ g)(6) =$

(a) 9

(b) 7

(c) 1

(d) 4

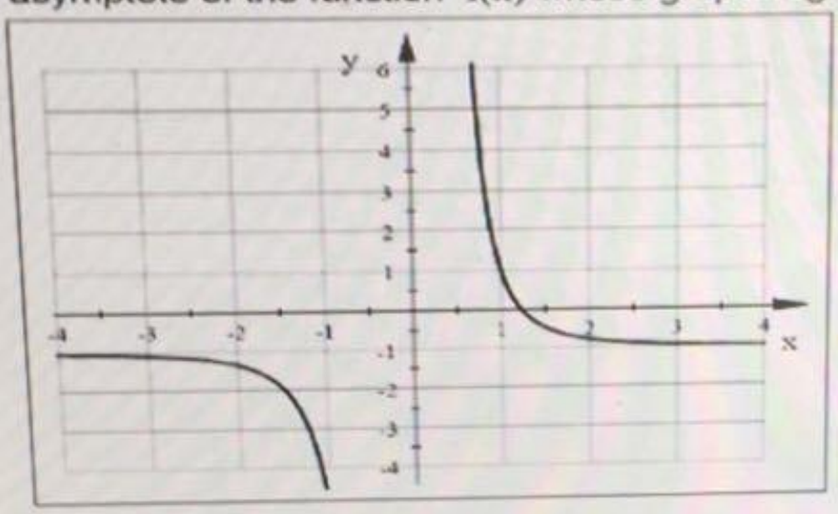
39 of 44

If $y = \frac{1}{8}x^2 + 2$, the equation of the **normal line** at the point $(-4, 4$

(a) $y = x + 8$ (b) $y = -x$ (c) $y = x$ (d) $y = -x + 8$

○ a
○ b
○ c
○ d

a horizontal asymptote of the function $f(x)$ whose graph is given is $y = -1$.



True
False

The inverse function of the function $f(x) = \ln(5x - 4)$ is

(a) $f^{-1}(x) = \frac{1}{5}(e^x + 4)$

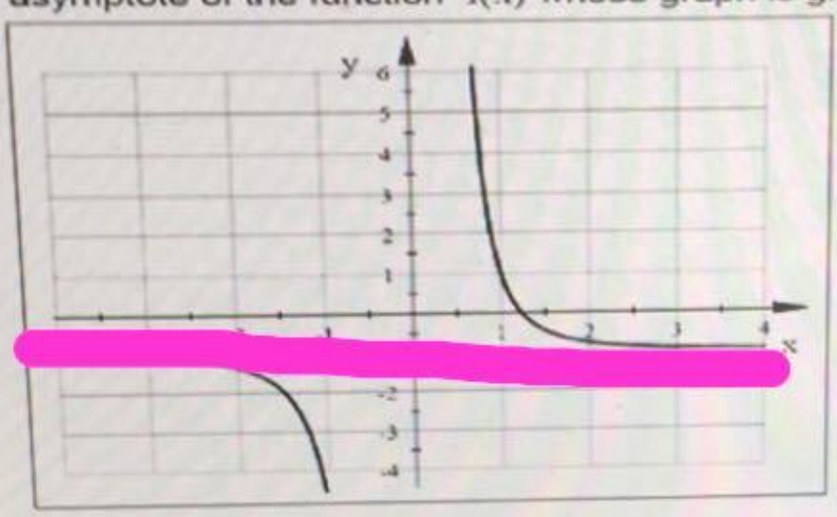
(b) $f^{-1}(x) = \frac{1}{5}(e^x - 4)$

(c) $f^{-1}(x) = \frac{1}{4}(e^x + 5)$

(d) $f^{-1}(x) = \frac{1}{4}(e^x - 5)$

- (a)
- (b)
- (c)
- (d)

a horizontal asymptote of the function $f(x)$ whose graph is given is $y = -1$.



True
False

$$F(x) = \ln(5x - 4)$$

$$F^{-1}(x) = \ln(5x - 4)$$

$$e^{y} = e^{\ln(5x-4)}$$

$$e^{y} = (5x - 4)$$

$$\frac{e^{y} + 4}{5} = \frac{5x}{5}$$

$$\frac{e^{y} + 4}{5} = x$$

$$\frac{e^{x} + 4}{5} = F(x)$$

$$\frac{1}{5}(e^{x} + 4) = F(x)$$

$7x$

$$y = \ln(5x - 4)$$

$e \quad e$

$$y_e = 5x - 4$$

$$\frac{y_e + 4}{5} = 5x \rightarrow f(x)^{-1} = \frac{x_e + 4}{5}$$

$\ln$

If $y = \ln \frac{1}{x-6}$

then y'

$y = \ln \left[\frac{1}{x-6}\right] = \ln x^{-6}$

$y = -6 \ln x$

$y' = -6 \cdot \left[\frac{1}{x}\right] = -6 x^{-1}$

(C)

$f(x) = 3x^2 + 8x - c$

critical number

$f'(x) = 6x + 8$

$f'(x) = 0 \Rightarrow 6x + 8 = 0$

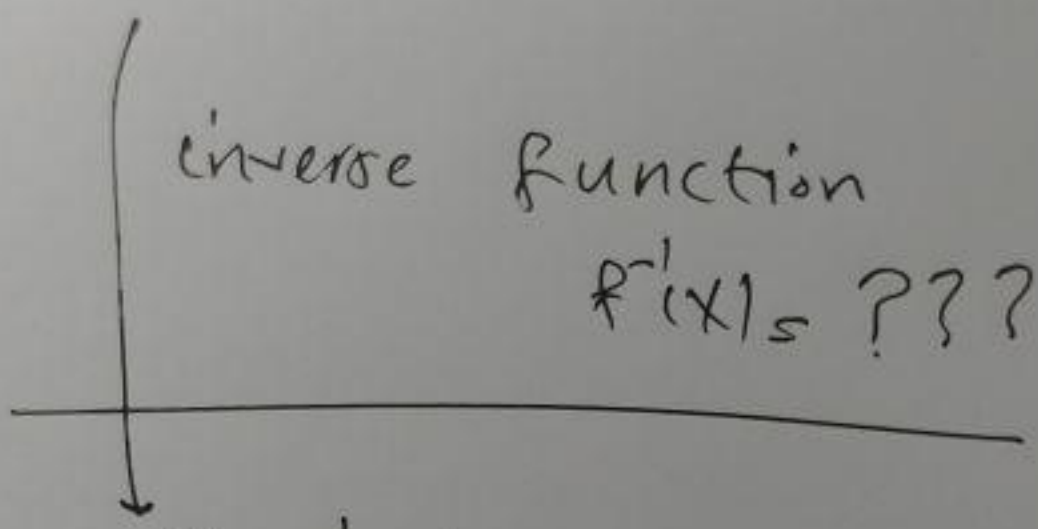
$6x = -8 \qquad \div 6$

$x = \frac{-8}{6}$

بالقسمة ع 2 بسطاً ومقاماً

$$x = \frac{-4}{3}$$

$f(x) = \ln(5x-4)$



$y = \ln(5x-4)$

$= e$

$e^y = e^{\ln(5x-4)}$

$e^y = 5x - 4$

$e^y + 4 = 5x \quad (\div 5)$

$x = \frac{1}{5}(e^y + 4) \quad x \to f^{-1}(x)$

$y \to x$

$f^{-1}(x) = \frac{1}{5}(e^x + 4)$ (a)

$$\tan\left(x+\frac{\pi}{2}\right)=\tan x$$

False

~ أي

$$\tan(x+\pi)=\tan x$$

π

$f(x) = 2x^2 - 2$ is

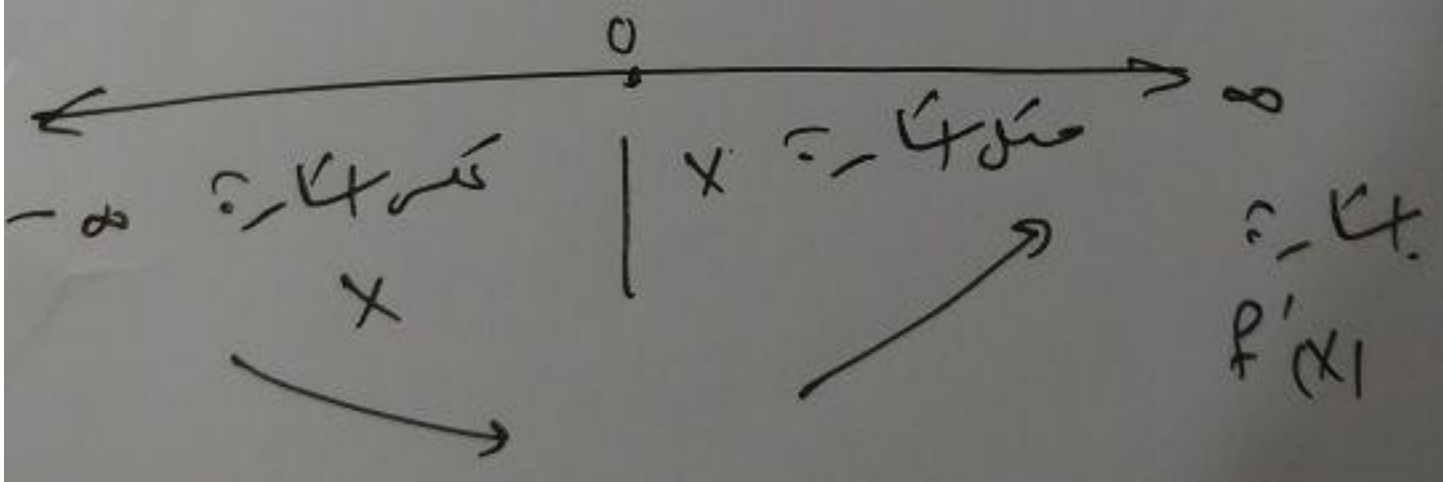
increasing on

$f'(x) = 4x$

$f'(x) = 0 \Longrightarrow 4x = 0$

$\div 4$

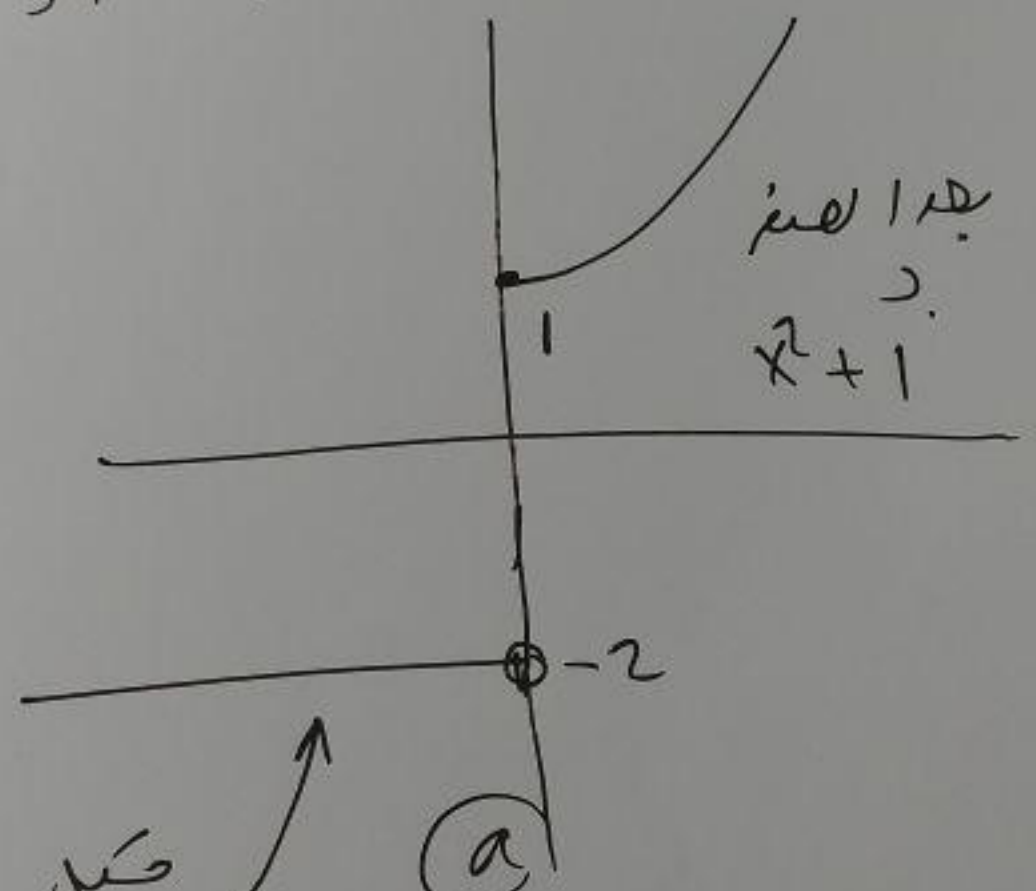
$x = 0$



Inc on $(0, \infty)$ (b)

$$f(x) = \begin{cases} x^2+1 & x \geq 0 \\ -2 & x < 0 \end{cases}$$

بيغ ارسم



هذا الشرط
د
x^2+1

حيل الشرط
-2 د

$f(x) = 3e^{3x}$ $\quad f''(0)$

$f'(x) = 3(3e^{3x})$

$= 9e^{3x}$

$f''(x) = 9(3e^{3x})$

$= 27e^{3x}$

$f''(0) = 27e^{0}$ $\quad e^{0} = 1$

$= 27(1)$

$= 27$

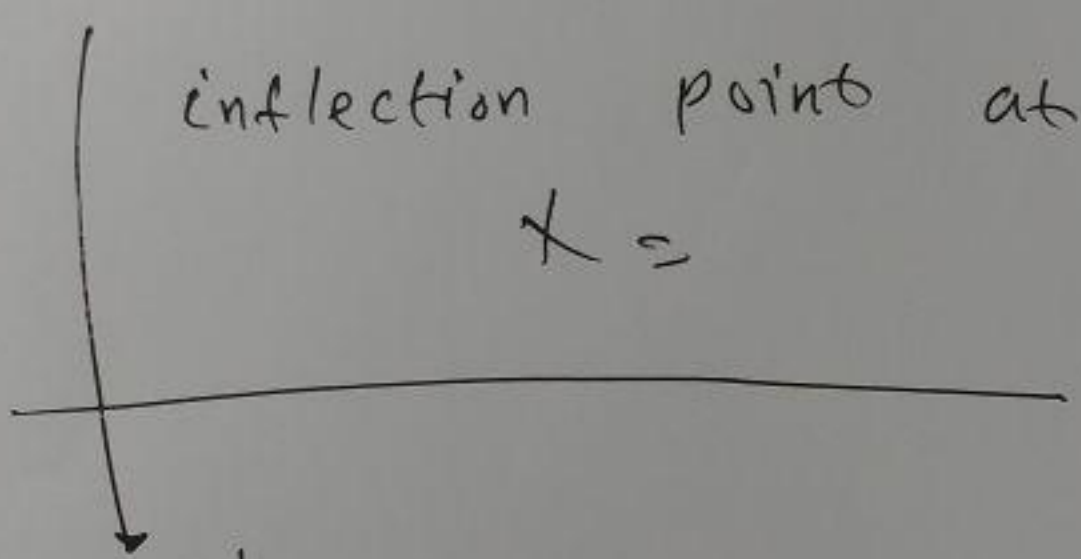
(C)

$$\lim_{x \to -1} (x^2 - 3x + 1)$$

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

$$= 1 + 3 + 1 = 5$$

$f(x) = -x^2 - 2x$



$f''(x) = -2$

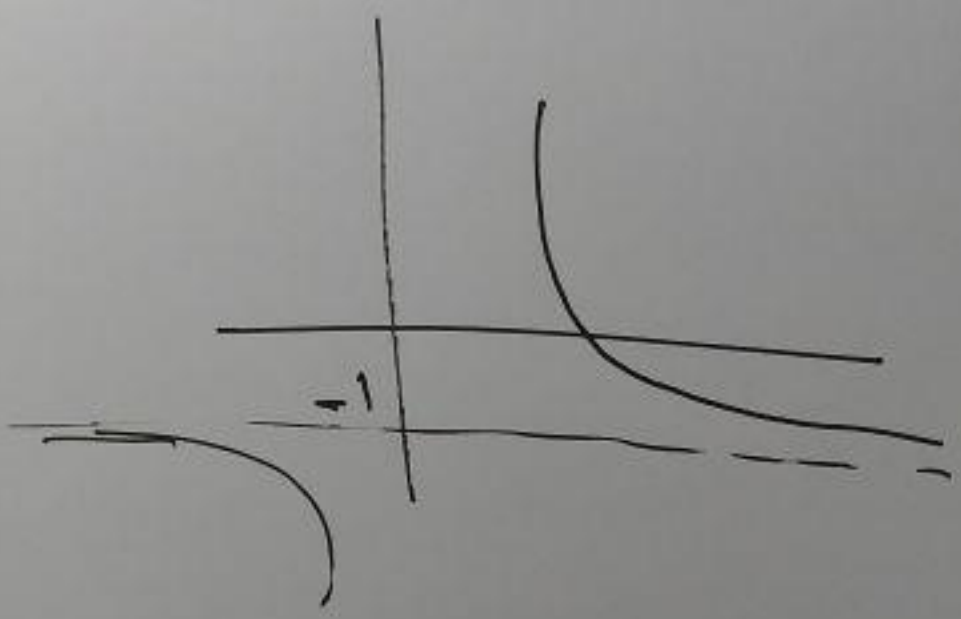
↑

∩ مقعر لأسفل دائماً

لا يوجد نقطة انعطاف

No inflection point

©



$y = -1$ is horizontal asymptot

True False

True @

$y = x^2 + 4x + 10$

has a horizontal tangent at

$y' = 2x + 4$

عند أفقي $y' = 0$

$2x + 4 = 0$

$2x = -4$ $\div 2$

$x = -2$

(b)

$f(\theta) = \cos(7\theta)$

$f'\left(\frac{\pi}{7}\right) = ??$

$f'(\theta) = -7 \sin(7\theta)$

$f'\left(\frac{\pi}{7}\right) = -7 \sin\left(7 \cdot \frac{\pi}{7}\right)$

$= -7 \sin \pi$

$= -7 \sin \pi$

$\sin \pi = 0$ $= -7(0) = 0$

(a)

$$\lim_{x \to 1} \frac{\cos x - 1}{x} = 1$$

True False

$$\lim_{x \to 1} \frac{\cos x - 1}{x}$$

$$= \frac{\cos 1 - 1}{1} \neq 1$$

False (b)

$$f(x) = |x^2 + 2x + \sqrt{3}|$$

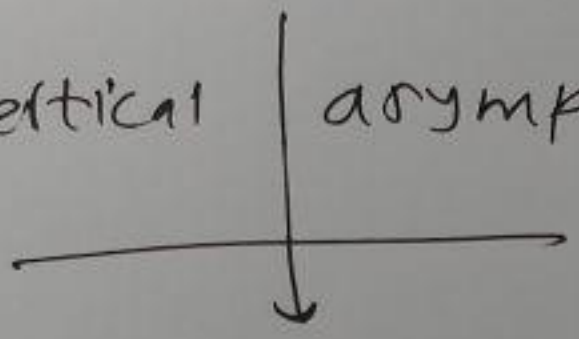
Domain of $f(x)$

$D_f = R$ @

لا يوجد مشاكل
في الدالة

$$f(x) = \frac{2x+3}{(x+5)^2}$$

Vertical asymptote



$x+5=0$

$x=-5$

$$f(-5) = \frac{2(-5)+3}{0} = \frac{-7}{0}$$

$x=-5$ is vertical asymptote

(b)

$f(x) = 1$ $\quad\quad$ $g(x) = x+3$

$(f \circ g)(x) = 1$

(C)

$$y = \frac{1}{8}x^2 + 2$$

The equation of the normal line at $(-4, 4)$

$$y' = \frac{1}{8}(2x) = \frac{1}{4}x$$

$$y'|_{x=-4} = \frac{1}{4}(-4)$$

$$= -1$$

then $m = \frac{-1}{y'|_{x=-4}} = \frac{-1}{-1} = 1$

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

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

$$y = x + 4 + 4 \Longrightarrow \boxed{y = x + 8}$$ (a)

$f(x) = \sqrt{x} + 3$

Domain of $f(x)$

$x \geq 0$

$D_f = [0, \infty)$

(d)

$f(x) = -x^2 + 9$

$f'(x) = -2x$

$f''(x) = -2$

$f''(x) < 0$

Concave down on $\mathbb{R}$

$f(x) = 3e^{3x}$ $\quad f''(0)$

$f'(x) = 3(3e^{3x})$

$= 9e^{3x}$

$f''(x) = 9(3e^{3x})$

$= 27e^{3x}$

$f''(0) = 27e^{0}$ $\quad e^{0} = 1$

$= 27(1)$

$= 27$

(C)

$y = x^{7x}$ y'

$\ln$

$\ln y = \ln x^{7x}$

$\ln y = 7x \cdot \ln x$

نشتق

$\frac{y'}{y} = 7 \cdot \ln x + 7x \cdot \frac{1}{x}$

نضرب بـ y

$y' = y\,[7 \ln x + 7]$

نعوض y بدلها

$y' = x^{7x} \cdot 7(\ln x + 1)$

$y' = 7x^{7x}(1 + \ln x)$ (b)

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$$\lim_{x \to 1} \frac{\cos x - 1}{x} = 1$$

- True
- False

If $f(x) = 1$ and $g(x) = x + 3$ then $(f \circ g)(6) =$

(a) 9

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(c) 1

(d) 4