

Multiple Choice Question Assignment

EI1-M3M4

Mathematics for Engineering II

I. ចូររកចម្លើយនៃដេរីវេរបស់អនុគមន៍ខាងក្រោម៖

1) $f(x) = 2 \cos(x) - 6 \sec(x) + 3$

A) $f'(x) = -2 \sin(x) - 6 \sec(x) \tan(x)$

B) $f'(x) = -2 \sin(x) - 6 \csc(x)$

C) $f'(x) = -2 \sin(x) - 6 \tan(x)$

D) មិនមាន

2) $g(z) = 10 \tan(z) - 2 \cot(z)$

A) $g'(z) = 10 \csc^2(z) + 2 \sec^2(z)$

B) $g'(z) = 10 \cot(z) - 2 \tan(z)$

C) $g'(z) = 10 \sec^2(z) + 2 \csc^2(z)$

D) មិនមាន

3) $f(w) = \tan(w) \sec(w)$

A) $f'(w) = \sec^2(w) + \sec^2(w) \tan(w)$

B) $f'(w) = \sec^3(w) + \sec(w) \tan^2(w)$

C) $f'(w) = \csc^3(w) + \csc(w) \tan^2(w)$

D) មិនមាន

4) $h(t) = t^3 - t^2 \sin(t)$

A) $h'(t) = 3t^2 - 2t \cos(t) - t^2 \cos(t)$

B) $h'(t) = 3t^2 - 2t \cos(t) - t \cos(t)$

C) $h'(t) = 3t^2 - 2t \sin(t) - t^2 \cos(t)$

D) មិនមាន

5) $y = 6 + 4\sqrt{x} \csc(x)$

A) $y' = 2x^{-\frac{1}{2}} \csc(x) - 4\sqrt{x} \csc(x) \cot(x)$

B) $y' = \frac{1}{2}x^{-\frac{1}{2}} \csc(x) - 4\sqrt{x} \csc(x) \tan(x)$

C) $y' = 6 + 4\sqrt{x} \csc(x) \cot(x)$

D) មិនមាន

6) $Z(v) = \frac{v + \tan(v)}{1 + \csc(v)}$

A) $Z'(v) = \frac{1 + \cot(v)}{(1 + \csc(v))^2}$

B) មិនមាន

C) $Z'(v) = \frac{(1 + \sec^2(v))(1 + \csc(v)) + (v + \tan(v))}{(1 + \csc(v))^2}$

D) $Z'(v) = \frac{(1 + \sec^2(v))(1 + \csc(v)) + \csc(v) \cot(v)(v + \tan(v))}{(1 + \csc(v))^2}$

II. ចូររកចម្លើយនៃដេរីវេរបស់អនុគមន៍ implicit ខាងក្រោម៖

7) $7y^2 + \sin(3x) = 12 - y^4$

$$A) y' = \frac{-3 \cos(3x)}{14y + 4y^3}$$

$$B) y' = \frac{-\cos(3x)}{12 - y^2}$$

$$C) y' = \frac{-3 \cos(3x)}{y + y^3}$$

D) មិនមានទេ

$$8) \tan(x^2 y^4) = 3x + y^2$$

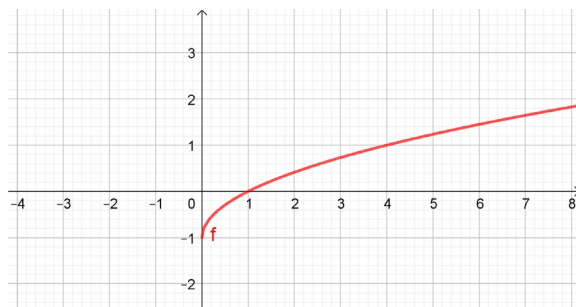
$$A) y' = \frac{3 - 2xy^4 \sec^2(x^2 y^4)}{4x^2 y^3 \sec^2(x^2 y^4) - 2y}$$

$$B) y' = \frac{-2xy^4 \sec^2(x^2 y^4)}{4x^2 y^3 \sec^2(x^2 y^4) - 2y}$$

$$C) y' = \frac{3 - 2xy^4 \sec^2(x^2 y^4)}{-2y}$$

D) មិនមានទេ

III. Use the graph to determine the function's domain and range.



9)

$$A) D: [0, \infty)$$

$$B) D: [-\infty, \infty)$$

$$C) D: [0, \infty)$$

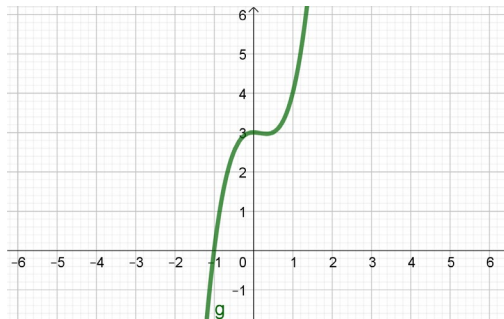
$$D) D: [0, \infty)$$

$$R: (-\infty, \infty)$$

$$R: (-1, \infty)$$

$$R: (-1, \infty)$$

$$R: [0, \infty)$$



10)

$$A) D: (2, 0)$$

$$B) D: (-2, 0)$$

$$C) D: (-\infty, \infty)$$

$$D) D: (-2, -2)$$

$$R: (0, 8)$$

$$R: (-\infty, \infty)$$

$$R: (-\infty, \infty)$$

$$R: (-2, 6)$$

11) Give the domain and range of the relation: $\{(11, -3), (2, -2), (2, 0), (6, 2), (18, 4)\}$

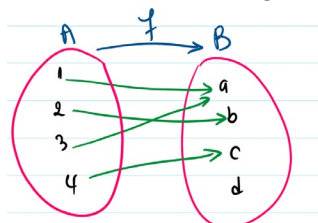
$$A) \text{domain: } \{-3, -2, 2, 4\}; \text{range: } \{11, 6, 2, 18\}$$

$$B) \text{domain: } \{11, 6, 2, 18\}; \text{range: } \{-3, -2, 2, 4\}$$

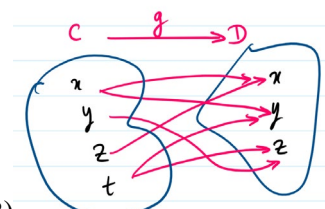
$$C) \text{domain: } \{-3, -2, 0, 2, 4\}; \text{range: } \{11, 6, 2, 18\}$$

$$D) \text{domain: } \{11, 6, 2, 18\}; \text{range: } \{-3, -2, 0, 2, 4\}$$

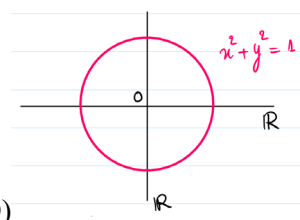
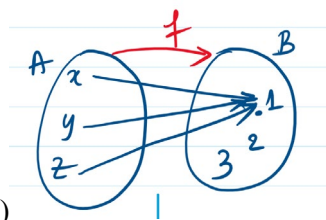
12) Which of the following diagram is a function?



A)



B)



IV. Determine whether the given function is even, odd, or neither

13) $f(x) = 5x^2 + x^4$

A) Odd

B) Even

C) Neither

14) $f(x) = -5x^5 + x^3$

A) Even

B) Odd

C) Neither

15) $f(x) = x^4 - x^3$

A) Odd

B) Neither

C) Even

V. Evaluate the piecewise function at the given value of the independent variable.

16) $f(x) = \begin{cases} 3x + 1 & \text{if } x < -1 \\ -2x - 5 & \text{if } x \geq -1 \end{cases}; f(2)$

A) -9

B) -8

C) -3

D) 1

17) $f(x) = \begin{cases} -x - 4 & \text{if } x < 3 \\ x^2 - 7 & \text{if } 3 \leq x \leq 10 \\ \frac{120}{x} + 5 & \text{if } x > 10 \end{cases}; f(4)$

A) -9

B) -8

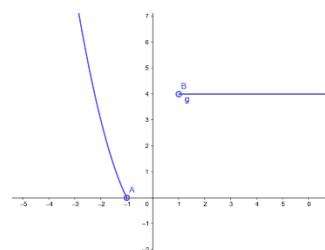
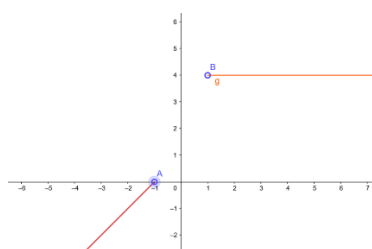
C) -3

D) 1

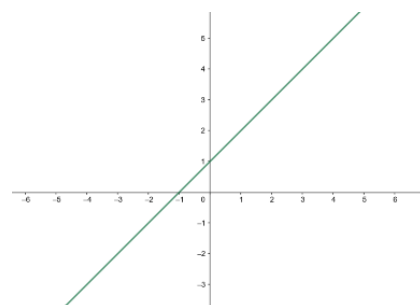
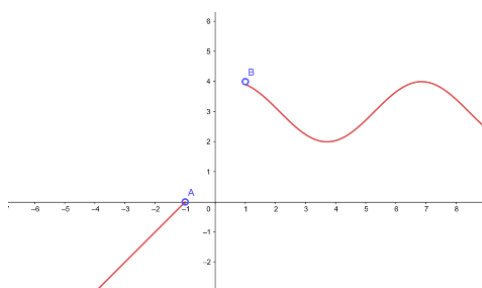
VI. Which one is the graph of the function?

18) $f(x) = \begin{cases} x + 1 & \text{if } x < -1 \\ 4 & \text{if } x > -1 \end{cases}$

A)

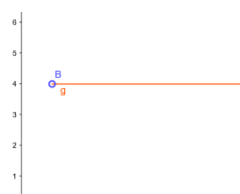


C)

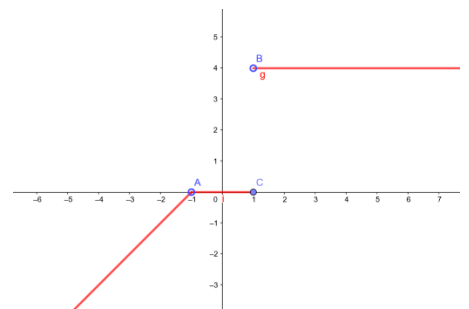
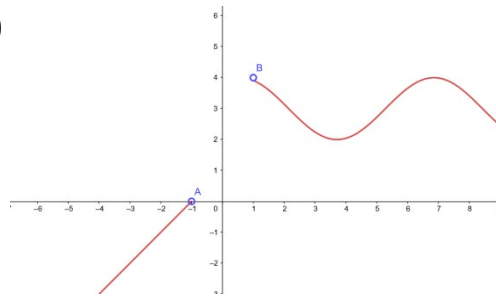


19) $f(x) = \begin{cases} x + 1 & \text{if } x < -1 \\ 4 & \text{if } x > -1 \\ 0 & \text{if } -1 \leq x \leq 1 \end{cases}$

A)

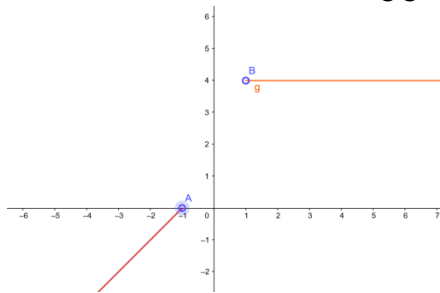


C)

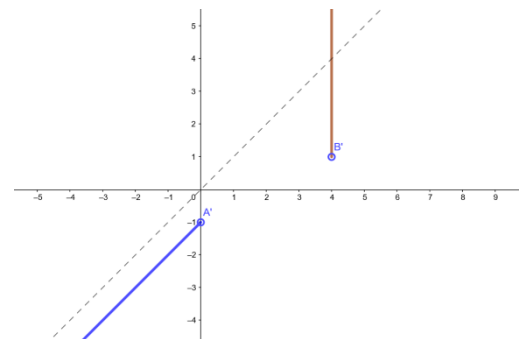
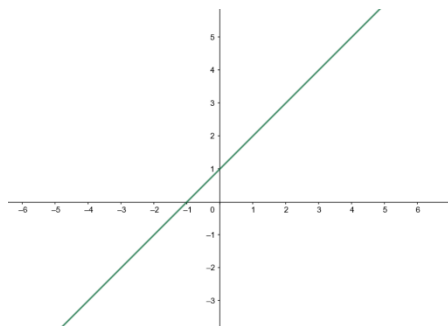


VII. Which one is the inverse of the following graph of the function?

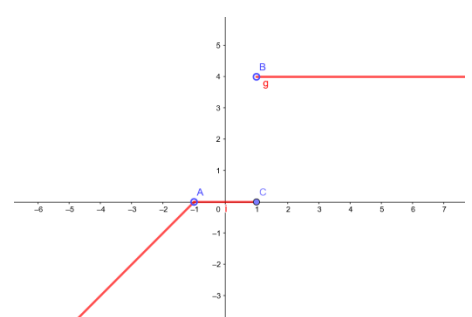
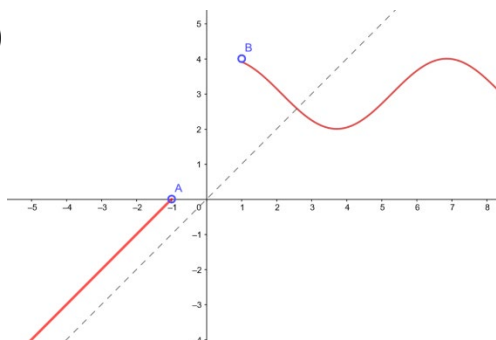
20)



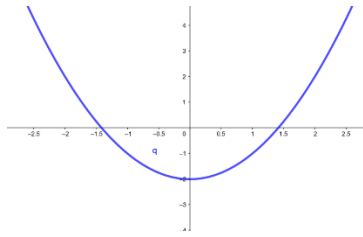
A)



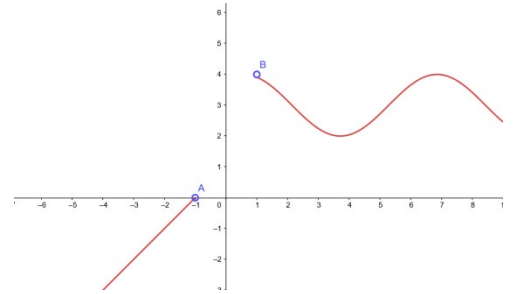
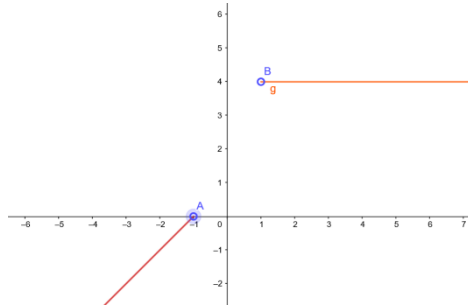
C)



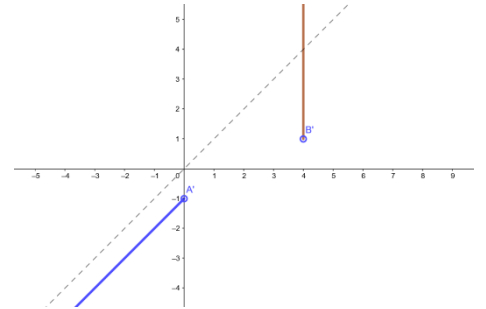
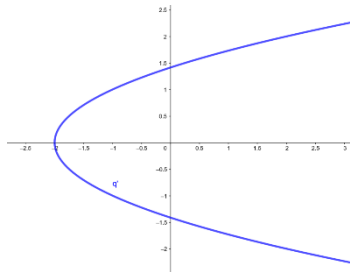
21)



A)



C)



VIII. ចូរអនុគមន៍បណ្តាក់ ក្នុងករណីនីមួយៗខាងក្រោម

22) $f(x) = 2x^2$ និង $g(x) = \frac{1}{x-1}$ ។ គណនា $f \circ g$?

A) $2 \frac{1}{(x-1)^2}$ B) -8 C) $2(x-1)^2$ D) $\frac{(x-1)^2}{2}$

23) $f(x) = x^2$ និង $g(x) = \frac{1}{\sec x - 1}$ ។ គណនា $g \circ f$?

A) $(\sec^2 x - 1)^{-1}$ B) $\sin\left(\frac{1}{(\sec x - 1)^2}\right)$ C) $2 \frac{1}{(x-1)^2}$ D) $(\sec x^2 - 1)^{-1}$

24) $m(x) = \text{sech}(x^2)$ និង $n(x) = \sin(x) - \frac{x^2}{3}$ ។ គណនា $n \circ m$?

A) $\sin^2(\sec x - 1)$ B) $\sin(\text{sech}(x^2)) - \frac{\text{sech}^2(x^2)}{3}$ C) $2 \frac{1}{(x-1)^2}$ D) $\frac{(x-1)^2}{2}$

IX. ចូរគណនាតម្លៃអនុគមន៍នីមួយៗខាងក្រោម

25) $\sin(\cos^{-1} x) = ?$

A) $\sqrt{x^2 - 1}$ B) $x^2 - 1$ C) $2(x-1)^2$ D) $\sqrt{1 - x^2}$

26) $\cos(\sin^{-1} x) = ?$

- A) $\sqrt{x^2 - 1}$ B) $\sqrt{1 - x^2}$ C) $2(x - 1)^2$ D) $x^2 - 1$

27) $\tan(2 \tan^{-1} x) = ?$

- A) $\frac{2x}{1 - x^2}$ B) $2(x - 1)^2$ C) $\frac{2}{1 - x^2}$ D) $x^2 - 1$

28) $\tan^{-1}\left(\frac{1}{2}\right) + \tan^{-1}\left(\frac{1}{2}\right) = ?$

- A) $\frac{\pi}{4}$ B) π^2 C) $\frac{2}{1 - x^2}$ D) $x^2 - 1$

X. Use the given conditions to write an equation for the line in the indicated form

29) Passing through (4, 3) and parallel to the line whose equation is $y = 2x - 6$; point-slope form is

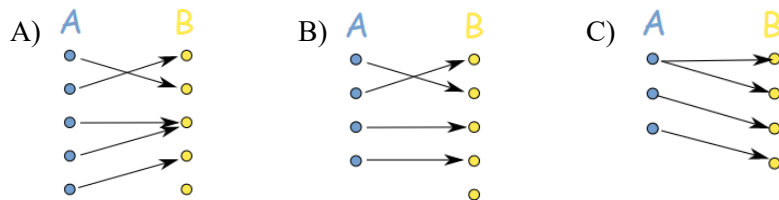
- A) $y - 3 = x - 4$ B) $y - 4 = 2(x - 3)$ C) $y = 2x$ D) $y - 3 = 2(x - 4)$

30) Passing through (5, 3) and perpendicular to the line whose equation is $y = 2x + 7$; point-slope form is

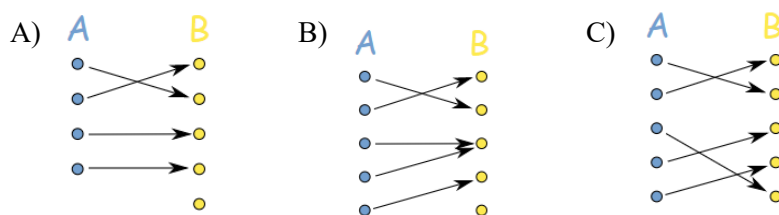
- A) $y = -2x - 11$ B) $y - 5 = \frac{1}{2}(x - 3)$ C) $y - 3 = \frac{1}{2}(x - 5)$ D)

$y - 3 = \frac{1}{2}(x + 5)$

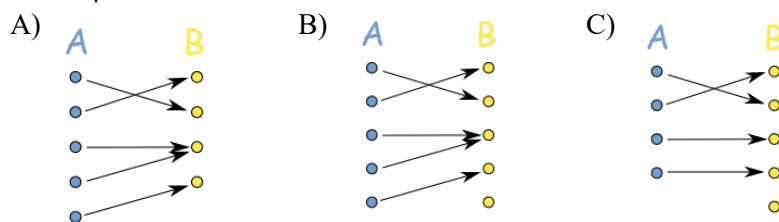
31) ក្នុងដ្យាក្រាមខាងក្រោម តើមួយណាជាអនុគមន៍ប្រកាន់?



32) ក្នុងដ្យាក្រាមខាងក្រោម តើមួយណាជាអនុគមន៍ពេញ?



33) ក្នុងដ្យាក្រាមខាងក្រោម តើមួយណាជាអនុគមន៍មួយទល់មួយ?



XI. ចូរបញ្ជាក់លក្ខណៈរបស់អនុគមន៍ខាងក្រោម៖

34) $f(x) = x^2 - 3$

- A) ពេញ B) ប្រកាន់ C) មួយទល់មួយ D) មិនដឹង

35) $f(x) = \frac{x^3 + 7}{x^2 - 2}$

- A) ប្រកាន់ B) ពេញ C) មួយទល់មួយ D) មិនដឹង

36) $f(x) = \frac{1}{x^2 - 2}$

- A) មិនដឹង B) ប្រកាន់ C) មួយទល់មួយ D) ពេញ

37) $f(x) = \frac{x^3 - 2}{x^2}$

- A) មួយទល់មួយ B) ប្រកាន់ C) ពេញ D) មិនដឹង

38) $f(x) = \sin(x), -\pi < x < \pi$

- A) មួយទល់មួយ B) ពេញ C) ប្រកាន់ D) មិនដឹង

XII. ចូរបញ្ជាក់ចន្លោះម៉ូណូតូនរបស់អនុគមន៍ខាងក្រោម៖

39) $f(x) = \frac{1}{x - 1}$

- A) ចុះលើ $\mathbb{R} \setminus \{1\}$ B) កើនលើ \mathbb{R} C) ថេរលើ $\mathbb{R} \setminus \{1\}$ D) មិនដឹង

40) $f(x) = \sin(x), -\pi < x < \pi$

- A) ចុះលើ \mathbb{R} B) កើនលើ $-\pi < x < \pi$ C) ថេរលើ $-\pi < x < \pi$ D) មិនដឹង

41) $g(x) = -x^3 - 2x^2 + x, -2 < x < 0$

- A) ចុះលើ $-2 < x < 0$ B) កើនលើ \mathbb{R} C) ថេរលើ \mathbb{R} D) មិនដឹង

42) $f(x) = -3, 0 < x < +\infty$

- A) ចុះលើ $-\infty < x < 0$ B) កើនលើ \mathbb{R} C) ថេរលើ $(0, +\infty)$ D) មិនដឹង

XIII. តើមួយណាជាចម្រាសរបស់អនុគមន៍ខាងក្រោម៖

43) $f(x) = \sinh(x)$

- A) $f^{-1}(x) = \ln(x + \sqrt{x^2 + 1})$ B) $f^{-1}(x) = \ln(x + \sqrt{x^2 - 1})$ C) $f^{-1}(x) = \ln\left(\frac{1+x}{1-x}\right)$

44) $h(x) = \tanh(x)$

- A) $h^{-1}(x) = \frac{1}{2} \ln\left(\frac{1+x}{1-x}\right), -1 < x < 1$ B) $h^{-1}(x) = \frac{1}{2} \ln(x^2 - 1)$ C) $h^{-1}(x) = \ln\left(\frac{1+x}{1-x}\right)$

XIV. តើមួយណាជាកន្សោមតម្លៃនៃអនុគមន៍ខាងក្រោម៖

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

- A) $\frac{f(x+3)}{f(x-1)} = f(4)$ B) $\frac{f(x+3)}{(x-1)} = f(4)$ C) $\frac{(x+3)}{f(x-1)} = f(4)$ D) គ្មានចម្លើយ

46) $f(x) = \frac{1}{x}$

- A) $-f(3) = f\left(\frac{3}{-2}\right)$ B) $f(1) - f(3) = f\left(\frac{3}{2}\right)$ C) $f(-2) = f\left(\frac{ab}{-b-a}\right)$ D) គ្មាន

ចម្លើយ

47) $g(x) = \frac{x-1}{x+1}$

- A) $f\left(-\frac{1}{x}\right) = -\frac{1}{x}$ B) $f(x) - f(3) = f\left(\frac{x}{3}\right)$ C) $f(x-2) = -x$ D) គ្មានចម្លើយ

XV. តើអនុគមន៍ខាងក្រោម ជាប់ត្រង់តម្លៃណា?

$$48) f(x) = \begin{cases} \frac{\sin x}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

$$A) x = \frac{\pi}{4}$$

$$B) x = 0$$

$$C) x = \frac{1}{2}$$

$$D) x = -1$$

$$49) f(x) = x - |x|$$

$$A) x = \frac{1}{2}$$

$$B) x = 0$$

$$C) x = 1$$

$$D) x = -1$$

$$50) f(x) = \begin{cases} \frac{x-6}{x-3}, & x < 0 \\ 2, & x = 0 \\ \sqrt{4+x^2}, & x > 0 \end{cases}$$

$$A) x = \frac{1}{2}$$

$$B) x = -1$$

$$C) x = 1$$

$$D) x = 0$$

XVI. តើអនុគមន៍ខាងក្រោមមិនជាប់ត្រង់តម្លៃ x_0 ឬទេ?

$$51) f(x) = \begin{cases} -2x + 4, & x > 1 \\ x + 1, & x < 1 \\ -1, & x = 1 \end{cases}$$

$$A) \text{ ជាប់ត្រង់ } x_0 = 1$$

$$B) \text{ មិនជាប់ត្រង់ } x_0 = 1$$

$$C) \text{ គ្មានយោបល់}$$

$$52) f(x) = \begin{cases} x + 1, & x \geq 2 \\ 2x - 1, & 1 < x < 2 \\ x - 1, & x \leq 1 \end{cases}$$

$$A) \text{ មិនជាប់ត្រង់ } x_0 = 1$$

$$B) \text{ ជាប់ត្រង់ } x_0 = 1$$

$$C) \text{ គ្មានយោបល់}$$

XVII. គណនាលីមីតខាងក្រោម៖

$$53) \lim_{t \rightarrow -1} \frac{t+1}{|t+1|}$$

$$A) -1$$

$$B) 1$$

$$C) 0$$

$$D) \text{ គ្មាន}$$

$$54) \lim_{z \rightarrow 4} \frac{\sqrt{z} - 2}{z - 4}$$

$$A) \frac{1}{4}$$

$$B) +\infty$$

$$C) 0$$

$$D) \text{ គ្មាន}$$

$$55) \lim_{x \rightarrow -3} \frac{\sqrt{2x+22} - 4}{x+3}$$

$$A) \text{ គ្មាន}$$

$$B) +\infty$$

$$C) \frac{1}{4}$$

$$D) 1$$

$$56) \lim_{x \rightarrow 0} \frac{x}{3 - \sqrt{x+9}}$$

$$A) -6$$

$$B) 1$$

$$C) \frac{1}{4}$$

$$D) +\infty$$

XVIII. គេអោយអនុគមន៍ $f(x) = \begin{cases} 7-4x & x < 1 \\ x^2+2 & x \geq 1 \end{cases}$ គណនាលីមីតខាងក្រោម៖

57) $\lim_{x \rightarrow -6} f(x)$

- A) -6 B) 1 C) 31 D) $+\infty$

58) $\lim_{x \rightarrow 1} f(x)$

- A) -6 B) 3 C) 31 D) $+\infty$

XIX. តើមួយណាជានិយមន័យនៃដើរវិវេកសំរាប់អនុគមន៍ខាងក្រោម៖

59) $f(t) = \frac{t}{1+t}$

A) $g'(t) = \lim_{h \rightarrow 0} \frac{1}{h} \left(\frac{t+h}{t+h+1} - \frac{t}{t+1} \right)$

$$\text{B) } g'(t) = \lim_{h \rightarrow 0} h \left(\frac{t+h}{t+h+1} - \frac{t}{t+1} \right)$$

C) $g'(t) = \frac{1}{(1+t)^2}$

D) មិនមានទេ

60) $R(z) = \sqrt{5z - 8}$

$$A) \quad R'(z) = \frac{1}{h} \lim_{h \rightarrow 0} \sqrt{5(z+h)-8} - \sqrt{5z-8}$$

$$\text{B) } R'(z) = -\frac{5}{2(5z-8)^2}$$

C) $R'(z) = \lim_{h \rightarrow 0} \frac{\sqrt{5(z+h)-8} - \sqrt{5z-8}}{h}$

D) មិនមានទេ

61) $f(x) = 2x^2 + 35$

A) $f'(x) = 4x$

$$\text{B) } f'(x) = \lim_{h \rightarrow 0} \frac{2(x+h)^2 + 35 - (2x^2 + 35)}{h}$$

C) មិនមានទេ

$$\text{D) } f'(x) = \frac{1}{h} \lim_{h \rightarrow 0} 2(x+h)^2 + 35 - (2x^2 + 35)$$

62) $R(z) = \frac{5}{z}$

A) $R'(z) = -\frac{5}{z^2}$

B) $R'(z) = \lim_{h \rightarrow 0} \left(\frac{5}{z+h} - \frac{5}{z} \right)$

C) $R'(z) = \frac{1}{h} \lim_{h \rightarrow 0} \left(\frac{5}{z+h} - \frac{5}{z} \right)$

D) មិនមានទេ

XX. ចូររកចម្លើយនៃដេរីវេលំដាប់ n របស់អនុគមន៍ខាងក្រោម៖

63) $y = \frac{1}{x}$

$$A) \quad y^{(n)} = \frac{(-1)^n n!}{x^{(n+1)}}$$

$$\text{B) } y^{(n)} = \frac{(-1)^n n!}{x^{(n)}}$$

$$C) \quad y^{(n)} = \frac{n!}{x^{(n+1)}}$$

D) មិនមានទេ

64) $y = xe^{2x}$

A) $y^{(n)} = 2^n (x + n)e^{2x}$

B) $y^{(n)} = e^{2x} + 2xe^{2x}$

C) $y^{(n)} = 2^{n-1}e^{2x}(2x + n)$

D) មិនមានទេ

65) $f(x) = x^n$

A) $f^{(n)}(x) = n!x^{n-(n-1)}$

C) $f^{(n)}(x) = n!x$

B) មិនមានទេ

D) $f^{(n)}(x) = n!$

XXI. ចូរកតម្លៃនៃដេរីវេលំដាប់ 2 របស់អនុគមន៍ខាងក្រោម៖

66) $y = \csc(x)$

A) $y'' = -\csc(x) + 2\csc^3(x)$

C) $y'' = \sec(x) + 2\csc^3(x)$

B) មិនមានទេ

D) $y'' = -\sec(x)$

67) $f(x) = \sinh(x)$

A) $f''(x) = \sinh(x)$

C) $f''(x) = \cosh(x)$

B) មិនមានទេ

D) $f''(x) = -\sinh(x)$

68) $g(x) = \frac{1}{1-x}$

A) $g''(x) = \frac{2}{(1-x)^3}$

C) $g''(x) = \frac{-2}{(1-x)^3}$

B) $g''(x) = \frac{2}{(1-x)^4}$

D) មិនមានទេ

XXII. ចូរកតម្លៃនៃដេរីវេលំដាប់ 3 របស់អនុគមន៍ខាងក្រោម៖

69) $y = x^3$

A) $y''' = 1$

C) $y''' = -6$

B) $y''' = 6$

D) មិនមានទេ

70) $y = \frac{1}{1-x}$

A) $y''' = \frac{6}{(1-x)^4}$

C) $y''' = -6(1-x)^{-4}$

B) $y''' = \frac{1}{(1-x)^6}$

D) មិនមានទេ

71) $y = \sec(x)$

A) $y''' = \sec(x)$

C) មិនមានទេ

B) $y''' = \frac{\sin^3(x) + 5\sin(x)}{\cos^4(x)}$

D) $y''' = \frac{\sin^3(x) + 5\sin(x)}{\cos(x)}$