Multiple Choice Question Assignment
EI1-M1M2

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

    A) $Z'(v) = \dfrac{1 + \cot(v)}{\left(1 + \csc(v)\right)^2}$ B) មិនមាន

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

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

II. ចូររកចម្លើយនៃដេរីវេរបស់អនុគមន៍ implicit ខាងក្រោម៖

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

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

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

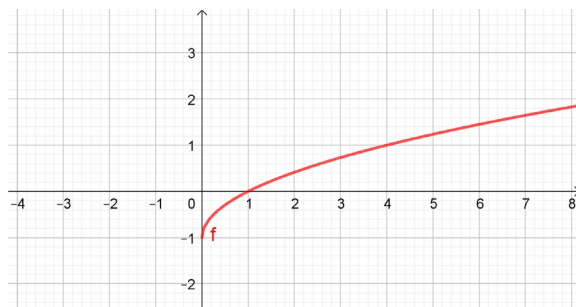C) $y' = \dfrac{-3\cos(3x)}{y + y^3}$

D) មិនមានទេ

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

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

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

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

D) មិនមានទេ

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

9)
A) D: $[0, \infty)$
 R: $(-\infty, \infty)$

B) D: $[-\infty, \infty)$
 R: $(-1, \infty)$

C) D: $[0, \infty)$
 R: $(-1, \infty)$

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

10)
A) D : $(2, 0)$
 R : $(0, 8)$

B) D : $(-2, 0)$
 R : $(-\infty, \infty)$

C) D : $(-\infty, \infty)$
 R : $(-\infty, \infty)$
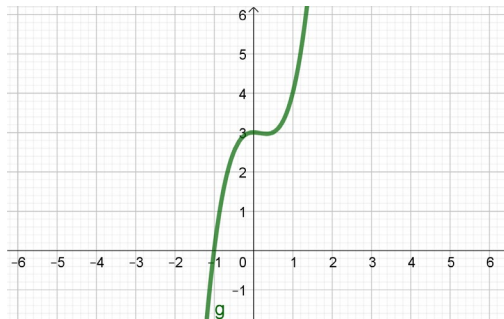
D) D : $(-2, -2)$
 R : $(-2, 6)$

11) Give the domain and range of the relation: $\{(11, -3), (2, -2), (2, 0), (6, 2), (18, 4)\}$
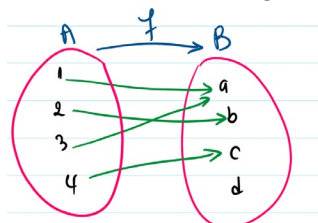 A) domain: $\{-3, -2, 2, 4\}$; range: $\{11, 6, 2, 18\}$
  B) domain: $\{11, 6, 2, 18\}$; range: $\{-3, -2, 2, 4\}$
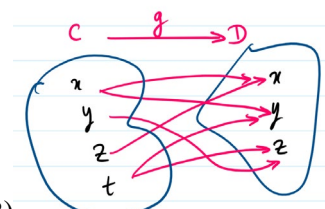 C) domain: $\{-3, -2, 0, 2, 4\}$; range: $\{11, 6, 2, 18\}$
  D) domain: $\{11, 6, 2, 18\}$; range: $\{-3, -2, 0, 2, 4\}$
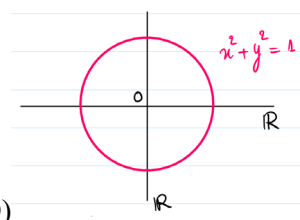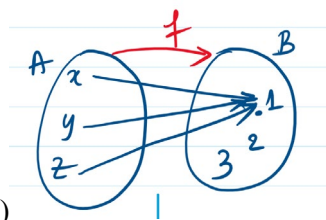
12) Which of the following diagram is a function?

A)

B)

C) | D)

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

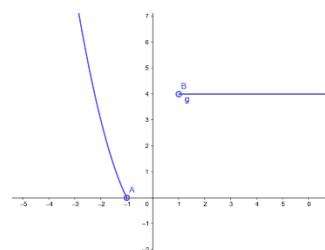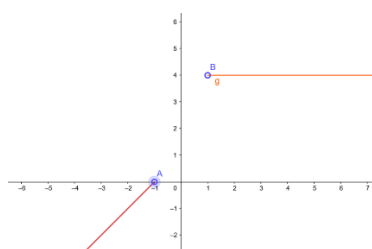   A) -9 B) -8 C) -3 D) 1
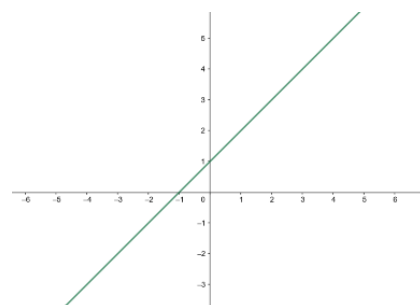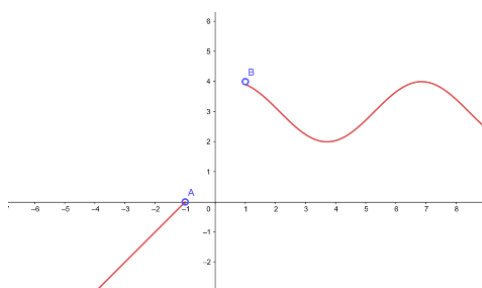
VI. Which one is the graph of the function?

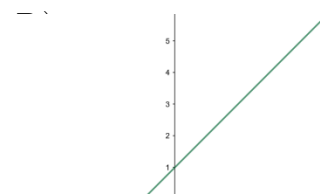18) $f(x) = \begin{cases} x+1 & \text{if } x < -1 \\ 4 & \text{if } x > -1 \end{cases}$
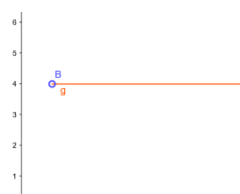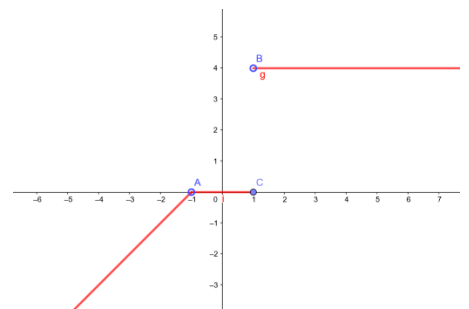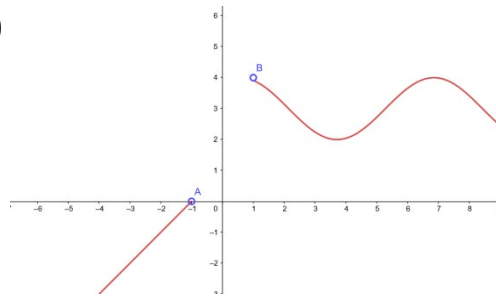
A)

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)
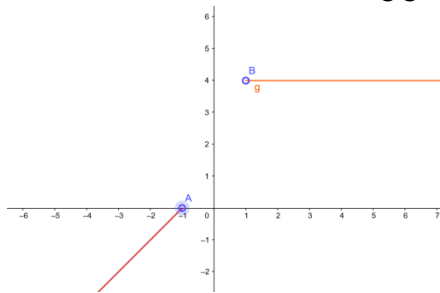
C)
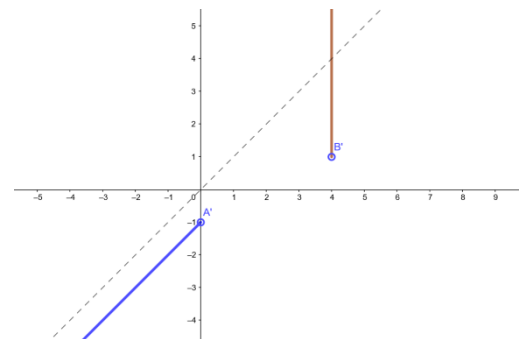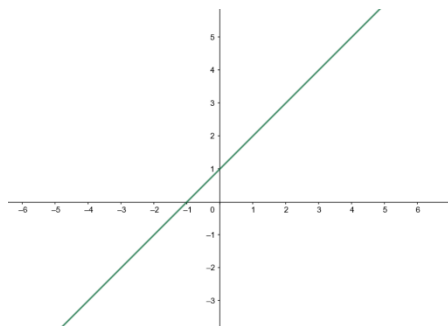

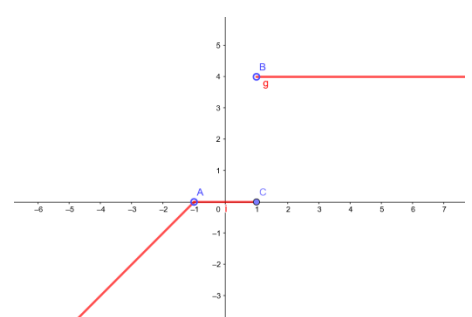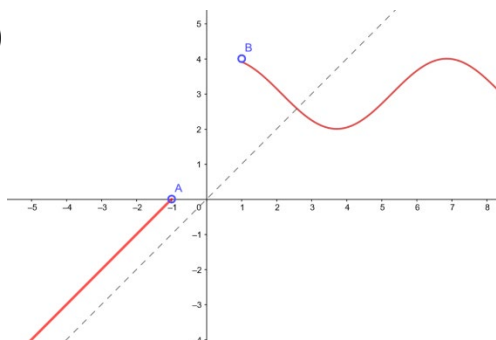VII. Which one is the inverse of the following graph of the function?

20)
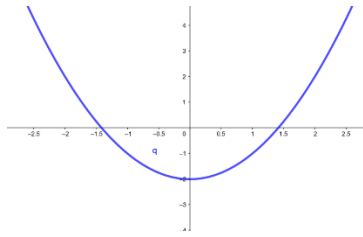

A)

C)

21)

A)

C)
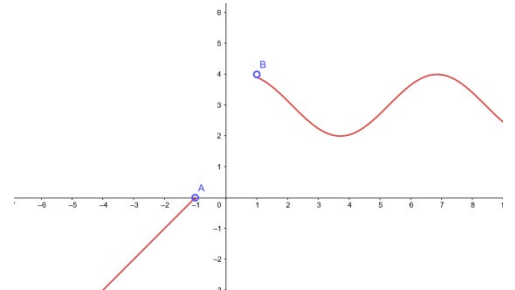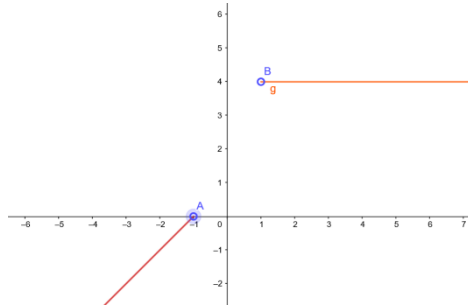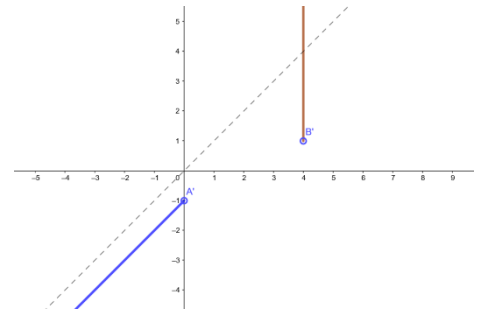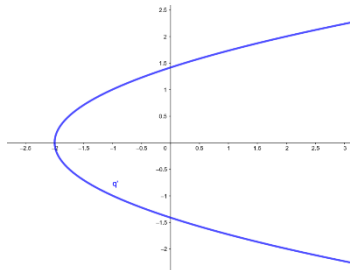
VIII. ចូររកអនុគមន៍បណ្ដាក់ ក្នុងករណីនីមួយៗខាងក្រោម

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

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

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

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

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

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

IX. ចូរគណនាតម្លៃអនុគមន៍នីមួយៗខាងក្រោម

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

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

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

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

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

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

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

A) $\dfrac{\pi}{4}$　　　　B) π^2　　　　C) $\dfrac{2}{1-x^2}$　　　　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) $y-5=\dfrac{1}{2}(x-3)$　　　C) $y-3=\dfrac{1}{2}(x-5)$　　　D)

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

31) ក្នុងឌ្យាក្រាមខាងក្រោម តើមួយណាជាអនុគមន៍ប្រកាន់ ?

A)　　　B)　　　C)
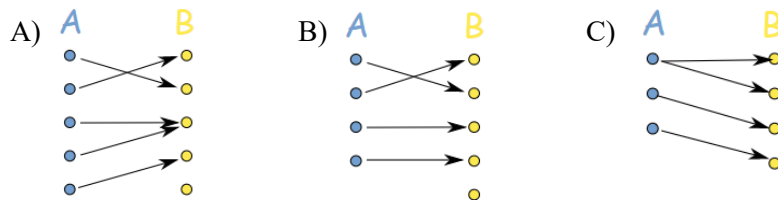
32) ក្នុងឌ្យាក្រាមខាងក្រោម តើមួយណាជាអនុគមន៍ពេញ ?

A)　　　B)　　　C)
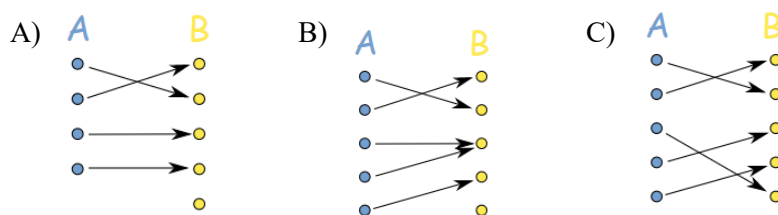
33) ក្នុងឌ្យាក្រាមខាងក្រោម តើមួយណាជាអនុគមន៍មួយទល់មួយ ?

A)　　　B)　　　C)

XI.　ចូរបញ្ជាក់លក្ខណៈរបស់អនុគមន៍ខាងក្រោម៖

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

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

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

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

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

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

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

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

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

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

XII.   ចូរបញ្ជាក់ចម្លើយមូលណ្ឌតូនរបស់អនុគមន៍ខាងក្រោម៖
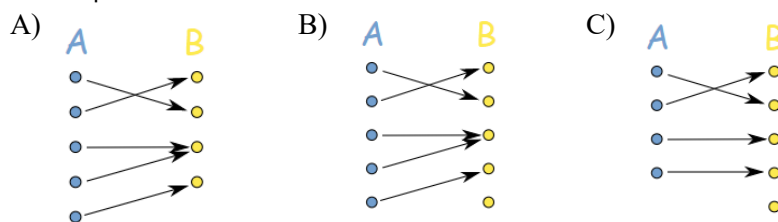
39) $f(x) = \dfrac{1}{x - 1}$

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

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

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

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

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

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

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

XIII.   តើមួយណាជាចម្រាសរបស់អនុគមន៍ខាងក្រោម៖

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

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

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

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

XIV.   តើមួយណាជាករណ្យាមតម្លៃនៃអនុគមន៍ខាងក្រោម៖

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

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

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

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

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

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

XV.   តើអនុគមន៍ខាងក្រោម ជាប់ត្រង់តម្លៃណា ?

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

A) $x = \dfrac{\pi}{4}$ B) $x = 0$ C) $x = \dfrac{1}{2}$ D) $x = -1$

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

A) $x = \dfrac{1}{2}$ B) $x = 0$ C) $x = 1$ D) $x = -1$

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

A) $x = \dfrac{1}{2}$ 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) ជាប់ត្រង់ $x_0 = 1$ B) មិនជាប់ត្រង់ $x_0 = 1$ C) គ្មានយោបល់

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

A) មិនជាប់ត្រង់ $x_0 = 1$ B) ជាប់ត្រង់ $x_0 = 1$ C) គ្មានយោបល់

XVII. គណនាលីមីតខាងក្រោម៖

53) $\displaystyle\lim_{t \to -1} \dfrac{t + 1}{|t + 1|}$

A) -1 B) 1 C) 0 D) គ្មាន

54) $\displaystyle\lim_{z \to 4} \dfrac{\sqrt{z} - 2}{z - 4}$

A) $\dfrac{1}{4}$ B) $+\infty$ C) 0 D) គ្មាន

55) $\displaystyle\lim_{x \to -3} \dfrac{\sqrt{2x + 22} - 4}{x + 3}$

A) គ្មាន   B) $+\infty$ C) $\dfrac{1}{4}$ D) 1

56) $\displaystyle\lim_{x \to 0} \dfrac{x}{3 - \sqrt{x + 9}}$

A) -6 B) 1 C) $\dfrac{1}{4}$ D) $+\infty$

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

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

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

58) $\displaystyle\lim_{x \to 1} f(x)$

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

XIX. តើមួយណាជានិយមន័យនៃដេរីវេរបស់អនុគមន៍ខាងក្រោម៖

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

A) $g'(t) = \displaystyle\lim_{h \to 0} \dfrac{1}{h}\left(\dfrac{t+h}{t+h+1} - \dfrac{t}{t+1} \right)$ B) $g'(t) = \displaystyle\lim_{h \to 0} h\left(\dfrac{t+h}{t+h+1} - \dfrac{t}{t+1} \right)$

C) $g'(t) = \dfrac{1}{(1+t)^2}$ D) មិនមានទេ

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

A) $R'(z) = \dfrac{1}{h}\displaystyle\lim_{h \to 0}\sqrt{5(z+h) - 8} - \sqrt{5z - 8}$ B) $R'(z) = -\dfrac{5}{2(5z - 8)^2}$

C) $R'(z) = \displaystyle\lim_{h \to 0} \dfrac{\sqrt{5(z+h) - 8} - \sqrt{5z - 8}}{h}$ D) មិនមានទេ

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

A) $f'(x) = 4x$ B) $f'(x) = \displaystyle\lim_{h \to 0} \dfrac{2(x+h)^2 + 35 - (2x^2 + 35)}{h}$

C) មិនមានទេ   D) $f'(x) = \dfrac{1}{h}\displaystyle\lim_{h \to 0} 2(x+h)^2 + 35 - (2x^2 + 35)$

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

A) $R'(z) = -\dfrac{5}{z^2}$ B) $R'(z) = \displaystyle\lim_{h \to 0}\left(\dfrac{5}{z+h} - \dfrac{5}{z} \right)$

C) $R'(z) = \dfrac{1}{h}\displaystyle\lim_{h \to 0}\left(\dfrac{5}{z+h} - \dfrac{5}{z} \right)$ D) មិនមានទេ

XX. ចូររកចម្លើយនៃដេរីវេលំដាប់ n របស់អនុគមន៍ខាងក្រោម៖

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

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

C) $y^{(n)} = \dfrac{n!}{x^{(n+1)}}$ 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) $f^{(n)}(x) = n!\, x^{n-(n-1)}$ B) មិនមានទេ

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

XXI.   ចូររកចម្លើយនៃដេរីវេលំដាប់ 2 របស់អនុគមន៍ខាងក្រោម៖

66) $y = \csc(x)$

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

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

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

A) $f''(x) = \sinh(x)$ B) មិនមានទេ

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

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

A) $g''(x) = \dfrac{2}{(1-x)^3}$ B) $g''(x) = \dfrac{2}{(1-x)^4}$

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

XXII.   ចូររកចម្លើយនៃដេរីវេលំដាប់ 3 របស់អនុគមន៍ខាងក្រោម៖

69) $y = x^3$

A) $y''' = 1$ B) $y''' = 6$

C) $y''' = -6$ D) មិនមានទេ

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

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

C) $y''' = -6(1-x)^{-4}$ D) មិនមានទេ

71) $y = \sec(x)$

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

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