6

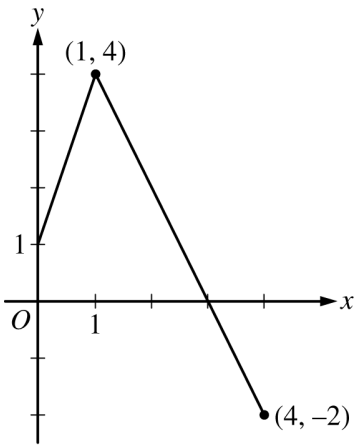
1. If $f(x)=\ln(e^{2x})$, then $f'(x)=$

(A) 1
(B) 2
(C) 2x
(D) e^{-2x}
(E) $2e^{-2x}$

2. An equation of the line tangent to the graph of $f(x) = x(1 - 2x)^3$ at the point (1,−1) is

(A) $y = -7x + 6$
(B) $y = -6x + 5$
(C) $y = -2x$
(D) $y = 2x - 3$
(E) $y = 7x - 8$

3.



Graph of f

The graph of the function f, consisting of two line segments, is shown in the figure above. Let g be the function given by $g(x) = 2x + 1$, and let h be the function given by $h(x) = f(g(x))$. What is the value of $h'(1)$?

(A) -4
(B) -2
(C) 4
(D) 6
(E) nonexistent

4. If $y = \left(\frac{x}{x+1}\right)^5$, then $\frac{dy}{dx}$ =

6

(A) $5(1+x)^4$

(B) $\frac{x^4}{(x+1)^4}$

(C) $\frac{5x^4}{(x+1)^4}$

(D) $\frac{5x^4}{(x+1)^6}$

(E) $\frac{5x^4(2x+1)}{(x+1)^6}$

5. If $f(x) = (x^2 - 3)^4$, then $f'(1) =$

(A) -64

(B) -32

(C) -16

(D) 32

6. If $y = \left(x^3 + 1\right)^2$, then $\frac{dy}{dx} =$

(A) $\left(3x^2\right)^2$

(B) $2\left(x^3 + 1\right)$

(C) $2\left(3x^2 + 1\right)$

(D) $3x^2\left(x^3 + 1\right)$

(E) $6x^2\left(x^3 + 1\right)$

7. If f and g are twice differentiable functions such that $g(x) = e^{f(x)}$ and $g''(x) = h(x)e^{f(x)}$, then $h(x) =$

(A) $f'(x) + f''(x)$

(B) $f'(x) + (f''(x))^2$

(C) $(f'(x) + f''(x))^2$

(D) $(f'(x))^2 + f''(x)$

(E) $2f'(x) + f''(x)$

8. If $y = \arctan\left(e^{2x}\right)$, then $\frac{dy}{dx} =$

(A) $\frac{2e^{2x}}{\sqrt{1-e^{4x}}}$

(B) $\frac{2e^{2x}}{1+e^{4x}}$

(C) $\frac{e^{2x}}{1+e^{4x}}$

(D) $\frac{1}{\sqrt{1-e^{4x}}}$

(E) $\frac{1}{1+e^{4x}}$

6

9. If $f(x) = e^{\tan^2 x}$, then $f'(x) =$

(A) $e^{\tan^2 x}$

(B) $\sec^2 x\ e^{\tan^2 x}$

(C) $\tan^2 x\ e^{\tan^2 x - 1}$

(D) $2\ \tan x\ \sec^2 x\ e^{\tan^2 x}$

(E) $2\ \tan x\ e^{\tan^2 x}$

10. If $y = \cos^2 3x$, then dy/dx=

(A) -6 sin 3x cos 3x

(B) -2 cos 3x

(C) 2 cos 3x

(D) 6 cos 3x

(E) 2 sin 3x cos 3x

11. If $f(x) = x^2 + 2x$, then $\frac{d}{dx}(f(\ln x)) =$

(A) $\frac{2\ln x + 2}{x}$

(B) $2x \ln x + 2x$

(C) $2 \ln x + 2$

(D) $2 \ln x + \frac{2}{x}$

(E) $\frac{2x+2}{x}$

12. If $f(x) = e^{(2/x)}$, then $f'(x) =$

(A) $2e^{(2/x)} \ln x$

(B) $e^{(2/x)}$

(C) $e^{(-2/x^2)}$

(D) $-\frac{2}{x^2} e^{(2/x)}$

(E) $-2x^2 e^{(2/x)}$

13. If $f(x) = e^{1/x}$, then *f'(x)*=

(A) $-\frac{e^{1/x}}{x^2}$

(B) $-e^{1/x}$

(C) $\frac{e^{1/x}}{x}$

(D) $\frac{e^{1/x}}{x^2}$

(E) $\frac{1}{x} e^{(1/x)-1}$

14. If $y = (x/x+1)^5$, then dy/dx

(A) $5(1+x)^4$

(B) $\frac{x^4}{(x+1)^4}$

(C) $\frac{5x^4}{(x+1)^4}$

(D) $\frac{5x^4}{(x+1)^6}$

(E) $\frac{5x^4 \cdot (2x+1)}{(x+1)^6}$

15. If $y = \sin^3 x$, then $\frac{dy}{dx} =$

(A) $\cos^3 x$

(B) $3\cos^2 x$

(C) $3\sin^2 x$

(D) $-3\sin^2 x \cos x$

(E) $3\sin^2 x \cos x$

16.

x	3	7
$h(x)$	7	22
$h'(x)$	5	10

Selected values of the increasing function *h* and its derivative h' are shown in the table above. If *g* is a differentiable function such that $h(g(x)) = x$ for all *x*, what is the value of $g'(7)$?

(A) $-1/10$

(B) $1/10$

(C) $1/5$

(D) $7/5$

17. If $f(x) = \cos(3x)$, then $f'\left(\frac{\pi}{9}\right) =$

(A) $\frac{3\sqrt{3}}{2}$

(B) $\frac{\sqrt{3}}{2}$

(C) $-\frac{\sqrt{3}}{2}$

(D) $-\frac{3}{2}$

(E) $-\frac{3\sqrt{3}}{2}$

18. If $f(x) = \cos^3(4x)$, then $f'(x) =$

(A) $3\cos^2(4x)$

(B) $-12\cos^2(4x)\sin(4x)$

(C) $-3\cos^2(4x)\sin(4x)$

(D) $12\cos^2(4x)\sin(4x)$

(E) $-4\sin^3(4x)$

19. Let f and g be differentiable functions such that

$$f(1) = 2, \quad f'(1) = 3, \quad f'(2) = -4,$$

$$g(1) = 2, \quad g'(1) = -3, \quad g'(2) = 5.$$

If $h(x) = f(g(x))$, then $h'(1) =$

(A) -9

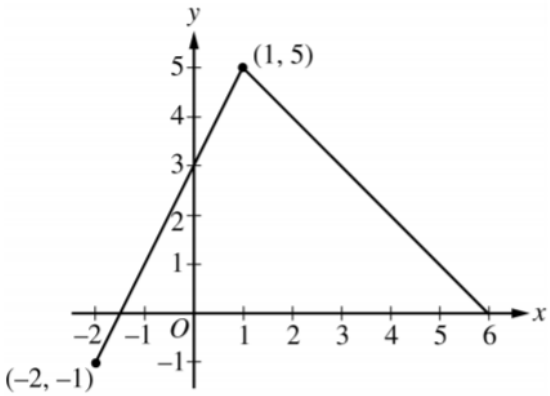
(B) -4

(C) 0

(D) 12

(E) 15

20.



Graph of g

The graph of the function g is shown above. If f is the function given by $f(x) = g(g(x))$, what is the value of $f'(0)$?

(A) -2

(B) -1

(C) 2

(D) 3

21. If $y = \left(x^3 - \cos x\right)^5$ then $y' =$

6

(A) $5\left(x^3-\cos x\right)^4$

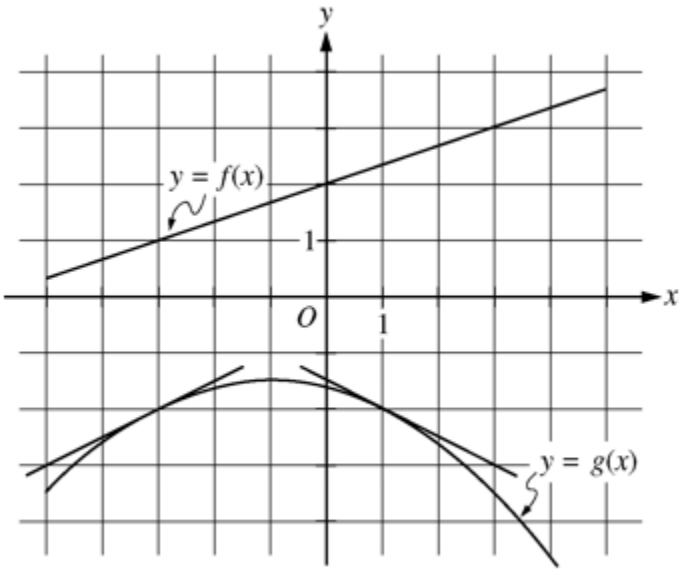
(B) $5\left(3x^2+\sin x\right)^4$

(C) $5\left(3x^2+\sin x\right)$

(D) $5\left(3x^2+\sin x\right)^4\cdot\left(6x+\cos x\right)$

(E) $5\left(x^3-\cos x\right)^4\cdot\left(3x^2+\sin x\right)$

22.



The figure above shows the graphs of the functions f and g. The graphs of the lines tangent to the graph of g at $x=-3$ and $x=1$ are also shown. If $B(x)=g(f(x))$, what is $B'(-3)$?

(A) $-\frac{1}{2}$

(B) $-\frac{1}{6}$

(C) $\frac{1}{6}$

(D) $\frac{1}{3}$

(E) $\frac{1}{2}$

6

23.

x	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
–1	–5	1	3	0
0	–2	0	1	1
1	0	–3	0	0.5
2	5	–1	5	2

The table above gives values of the differentiable functions f and g and of their derivatives f' and g', at selected values of x. If $h(x) = f(g(x))$, what is the slope of the graph of h at $x = 2$?

(A) -10
(B) -6
(C) 5
(D) 6
(E) 10

24. For $x > 0$, $\frac{d}{dx}\left(\int_0^{2x} \ln\left(t^3+1\right)\,dt\right) =$

(A) $\ln\left(x^3+1\right)$
(B) $\ln\left(8x^3+1\right)$
(C) $2\ln\left(x^3+1\right)$
(D) $2\ln\left(8x^3+1\right)$
(E) $24x^2\ln\left(8x^3+1\right)$

25. For $x > 0$, $\frac{d}{dx}\int_1^{\sqrt{x}} \frac{1}{1+t^2}\,dt =$

(A) $\frac{1}{2\sqrt{x}(1+x)}$
(B) $\frac{1}{2\sqrt{x}(1+\sqrt{x})}$
(C) $\frac{1}{1+x}$
(D) $\frac{\sqrt{x}}{1+x}$
(E) $\frac{1}{1+\sqrt{x}}$

26. Let $f(x) = \int_0^{x^2} \sin t\ dt$. At how many points in the closed interval $\left[0, \sqrt{\pi}\right]$ does the instantaneous rate of change of f equal the average rate of change of f on that interval?

6

(A) Zero
(B) One
(C) Two
(D) Three
(E) Four

27. If f is a differentiable function and $y = \sin\left(f\left(x^2\right)\right)$ what is $\frac{dy}{dx}$ when $x = 3$?

(A) $cos\ (f'(9))$
(B) $6cos\ (f(9))$
(C) \(f'\left(9\right)\cos\left(f\left(9\right)\right)\)
(D) \(6f'\left(9\right)\cos\left(f\left(9\right)\right)\)

28. If $f(x) = x^2 - 4$ and g is a differentiable function of x, what is the derivative of f(g(x))?

(A) $2g(x)$
(B) $2g'(x)$
(C) $2xg'(x)$
(D) $2g(x)g'(x)$
(E) $2g(x) - 4$

29.

If $f(x) = (2x^2 + 5)^7$, then $f'(x) =$

(A) $7(4x)^6$
(B) $7(2x^2 + 5)^6$
(C) $14x^2(2x^2 + 5)^6$
(D) $28x(2x^2 + 5)^6$

30.

If $f(x) = \cos^2(3x - 5)$, then $f'(x) =$

(A) $6\cos(3x - 5)$
(B) $-3\sin^2(3x - 5)$
(C) $-2\sin(3x - 5)\cos(3x - 5)$
(D) $-6\sin(3x - 5)\cos(3x - 5)$

6

31.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
–2	–6	9	–10	16
1	5	–3	3	–2
3	0	7	8	3

The table above gives values of f, f', g, and g ¢ for selected values of x. If $h(x) = f(g(x))$, what is the value of $h'(1)$?

(A) -19
(B) -14
(C) 7
(D) 9

32.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
–1	6	5	3	–2
1	3	–3	–1	2
3	1	–2	2	3

The table above gives values of f, f', g, and g' at selected values of x. If $h(x) = f(g(x))$, then $h'(1) =$

(A) 5
(B) 6
(C) 9
(D) 10
(E) 12

33. If $f(x) = ae^{-ax}$ for $a > 0$, then $f'(x) =$

(A) e^{-ax}
(B) ae^{-ax}
(C) a^2e^{-ax}
(D) $-ae^{-ax}$
(E) $-a^2e^{-ax}$

34. If $f'(x) = \frac{(x-2)^3(x^2-4)}{16}$ and $g(x) = f\left(x^2 - 1\right)$, what is $g'(2)$?

6

(A) 2

(B) $\frac{5}{4}$

(C) $\frac{5}{8}$

(D) $\frac{5}{16}$

(E) 0

35. $d/dx(\ln e^{2x}) =$

(A) $1/e^{2x}$

(B) $2/e^{2x}$

(C) $2x$

(D) 1

(E) 2

36. If $y = x^2 \sin 2x$, then $\frac{dy}{dx} =$

(A) $2x \cos 2x$

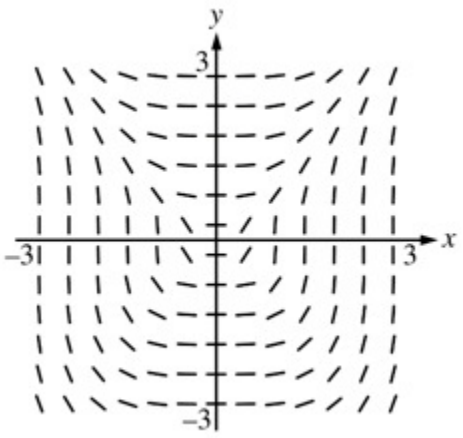
(B) $4x \cos 2x$

(C) $2x(\sin 2x + \cos 2x)$

(D) $2x(\sin 2x - x \cos 2x)$

(E) $2x(\sin 2x + x \cos 2x)$

37.



Shown above is a slope field for which of the following differential equations?

6

(A) $\frac{dy}{dx} = \frac{x}{y}$

(B) $\frac{dy}{dx} = \frac{x^2}{y^2}$

(C) $\frac{dy}{dx} = \frac{x^3}{y}$

(D) $\frac{dy}{dx} = \frac{x^2}{y}$

(E) $\frac{dy}{dx} = \frac{x^3}{y^2}$

38. If $f(x) = e^{2x}\left(x^3 + 1\right)$, then $f'(2) =$

(A) $6e^4$

(B) $21e^4$

(C) $24e^4$

(D) $30e^4$

39. If $f(x)=\tan(2x)$, then $f'\left(\frac{\pi}{6}\right) =$

(A) $\sqrt{3}$

(B) $2\sqrt{3}$

(C) 4

(D) $4\sqrt{3}$

(E) 8

40. If $y = \cos 2x$, then $\frac{dy}{dx}$ =

(A) -2sin 2x

(B) -sin 2x

(C) sin 2x

(D) 2 sin 2x

(E) 2 sin x

41.

If $f(x) = \sin^2(3 - x)$, then $f'(0) =$

(A) –2 cos 3

(B) –2 sin 3 cos 3

(C) 6 cos 3

(D) 2 sin 3 cos 3

(E) 6 sin 3 cos 3

6

42. If $f(x) = \left(x^2 - 2x - 1\right)^{\frac{2}{3}}$, then $f'(0)$ is

(A) $\frac{4}{3}$
(B) 0
(C) $-\frac{2}{3}$
(D) $-\frac{4}{3}$
(E) -2

43. If $f(x)=\sin(e^{-x})$, then $f'(x)=$
(A) $-\cos(e^{-x})$
(B) $\cos(e^{-x})+e^{-x}$
(C) $\cos(e^{-x})-e^{-x}$
(D) $e^{-x}\cos(e^{-x})$
(E) $-e^{-x}\cos(e^{-x})$

44. If $f(x) = \ln\left(x + 4 + e^{-3x}\right)$, then $f'(0)$ is
(A) $-\frac{2}{5}$
(B) $\frac{1}{5}$
(C) $\frac{1}{4}$
(D) $\frac{2}{5}$
(E) nonexistent

45. If $f(x) = \ln\left(x + 4 + e^{-3x}\right)$, then $f'(0)$ is
(A) $-\frac{2}{5}$
(B) $\frac{1}{5}$
(C) $\frac{1}{4}$
(D) $\frac{2}{5}$
(E) nonexistent

46. $\frac{d}{dx}\left(\sin^3\left(x^2\right)\right) =$
(A) $\cos^3\left(x^2\right)$
(B) $3\sin^2\left(x^2\right)$
(C) $6x\sin^2\left(x^2\right)$
(D) $3\sin^2\left(x^2\right)\cos\left(x^2\right)$
(E) $6x\sin^2\left(x^2\right)\cos\left(x^2\right)$

6

47. $\frac{d}{dx}\ \ln|\cos(\frac{\pi}{x})|$ is

(A) $\frac{-\pi}{x^2\ \cos(\frac{\pi}{x})}$

(B) $-\tan(\frac{\pi}{x})$

(C) $\frac{1}{\cos(\frac{\pi}{x})}$

(D) $\frac{\pi}{x}\ \tan(\frac{\pi}{x})$

(E) $\frac{\pi}{x^2}\tan(\frac{\pi}{x})$

48. If $y = x^2 - 2x$ and $u = 2x + 1$, then $\frac{dy}{du}$ =

(A) $\frac{2(x^2+x-1)}{(2x+1)^2}$

(B) $6x^2 - 3x - 2$

(C) 4x

(D) $x - 1$

(E) $\frac{1}{x-1}$

49. If $f(x) = \ln(\ln x)$, then $f'(x)$ =

(A) $1/x$

(B) $1/\ln x$

(C) $\ln x/x$

(D) x

(E) $1/x \ln x$

50.

If $f(x) = (x - 1)(x^2 + 2)^3$, then $f'(x)$ =

(A) $6x(x^2+2)^2$

(B) $6x(x - 1)(x^2 + 2)^2$

(C) $(x^2 + 2)^2(x^2 + 3x - 1)$

(D) $(x^2 + 2)^2(7x^2 - 6x + 2)$

(E) $-3(x - 1)(x^2 + 2)^2$

51. If $f(x) = (x - 1)^{\frac{3}{2}} + \frac{e^{x-2}}{2}$, then $f'(2) =$

(A) 1
(B) $\frac{3}{2}$
(C) 2
(D) $\frac{7}{2}$
(E) $\frac{3+e}{2}$

52. The slope of the line tangent to the graph of $y = \ln(1 - x)$ at x = -1 is

(A) -1
(B) -1/2
(C) 1/2
(D) ln 2
(E) 1

53. If *f* and *g* are twice differentiable and if $h(x) = f(g(x))$, then $h''(x) =$

(A) $f''(g(x))[g'(x)]^2 + f'(g(x))g''(x)$
(B) $f''(g(x))g'(x) + f'(g(x))g''(x)$
(C) $f''(g(x))[g'(x)]^2$
(D) $f''(g(x))g''(x)$
(E) $f''(g(x))$

54. If $\frac{d}{dx} f(x) = g(x)$ and if $h(x) = x^2$, then $\frac{d}{dx}(f(h(x))) =$

(A) $g(x^2)$
(B) $2xg(x)$
(C) $g'(x)$
(D) $2xg(x^2)$
(E) $x^2g(x^2)$

55. If $f(x) = \sin(x^2 + \pi)$, then $f'\left(\sqrt{2\pi}\right) =$

(A) $-2\sqrt{2\pi}$
(B) -2
(C) -1
(D) $\cos\left(2\sqrt{2\pi}\right)$

56. If *f* is the function given by $f(x) = e^{x/3}$, which of the following is an equation of the line tangent to the graph of *f* at the point (3 ln 4, 4) ?

6

(A) $y - 4 = \frac{4}{3}(x - 3\ln 4)$

(B) $y - 4 = 4(x - 3\ln 4)$

(C) $y - 4 = 12(x - 3\ln 4)$

(D) $y - 3\ln 4 = 4(x - 4)$

57. If $f(x) = \sqrt{x^2 - 4}$ and $g(x) = 3x - 2$, then the derivative of $f(g(x))$ at $x = 3$ is

(A) $\frac{7}{\sqrt{5}}$

(B) $\frac{14}{\sqrt{5}}$

(C) $\frac{18}{\sqrt{5}}$

(D) $\frac{15}{\sqrt{21}}$

(E) $\frac{30}{\sqrt{21}}$

58. The slope of the line tangent to the graph of y = ln(1-x) at x = -1 is

(A) -1

(B) -1/2

(C) 1/2

(D) ln2

(E) 1

59. If $f(x) = (\ln x)^2$, then $f''\left(\sqrt{e}\right) =$

(A) $\frac{1}{e}$

(B) $\frac{2}{e}$

(C) $\frac{1}{2\sqrt{e}}$

(D) $\frac{1}{\sqrt{e}}$

(E) $\frac{2}{\sqrt{e}}$

60.

Let *h* be a differentiable function, and let *f* be the function defined by $f(x) = h(x^2 - 3)$. Which of the following is equal to $f'(2)$?

(A) *h'(1)*

(B) $4h'(1)$

(C) $4h'(2)$

(D) *h'(4)*

(E) $4h'(4)$

61. If $\frac{d}{dx}(f(x)) = g(x)$ and $\frac{d}{dx}(g(x)) = f(x^2)$, then $\frac{d^2}{dx^2}(f(x^3)) =$

(A) $f(x^6)$

(B) $g(x^3)$

(C) $3x^2 g(x^3)$

(D) $9x^4 f(x^6) + 6x\, g(x^3)$

(E) $f(x^6) + g(x^3)$

62. $\frac{d}{dx}\left(2\left(\sin\sqrt{x}\right)^2\right) =$

(A) $4\cos\left(\frac{1}{2\sqrt{x}}\right)$

(B) $4\sin\sqrt{x}\,\cos\sqrt{x}$

(C) $\frac{2\sin\sqrt{x}}{\sqrt{x}}$

(D) $\frac{2\sin\sqrt{x}\,\cos\sqrt{x}}{\sqrt{x}}$

63. If $f(x) = \left(\cos\left(\sqrt{x}\right) - \ln\left(x^2\right)\right)^3$, then $f'(x) =$

(A) $3\left(-\frac{1}{2\sqrt{x}}\sin\left(\sqrt{x}\right) - \frac{2}{x}\right)^2$

(B) $3\left(\cos\left(\sqrt{x}\right) - \ln\left(x^2\right)\right)^2 \cdot \left(-\sin\left(\sqrt{x}\right) - \frac{1}{x^2}\right)$

(C) $3\left(\cos\left(\sqrt{x}\right) - \ln\left(x^2\right)\right)^2 \cdot \left(\frac{1}{2\sqrt{x}}\cos\left(\sqrt{x}\right) - \frac{2}{x}\right)$

(D) $3\left(\cos\left(\sqrt{x}\right) - \ln\left(x^2\right)\right)^2 \cdot \left(-\frac{1}{2\sqrt{x}}\sin\left(\sqrt{x}\right) - \frac{2}{x}\right)$

64. Let $f(x) = 5x^4$ and $g(x) = e^{2x} + x$. If h is the function defined by $h(x) = f(g(x))$, which of the following gives a correct expression for $h'(x)$?

(A) $20(g(x))^3 = 20\left(e^{2x} + x\right)^3$

(B) $20(g'(x))^3 = 20\left(2e^{2x} + 1\right)^3$

(C) $20(g(x))^3 \cdot g'(x) = 20\left(e^{2x} + x\right)^3 \cdot \left(2e^{2x} + 1\right)$

(D) $5(g'(x))^4 = 5\left(2e^{2x} + 1\right)^4$

65. Let $f(x) = x^3$ and $g(x) = \frac{x}{x-1}$. If h is the function defined by $h(x) = f(g(x))$, which of the following gives a correct expression for $h'(x)$?

6

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

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

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

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

66. Let f be the function defined by $f(x) = e^{h(x)}$, where h is a differentiable function. Which of the following is equivalent to the derivative of f with respect to x ?

(A) $e^{h(x)}$

(B) $e^{h'(x)}$

(C) $h'(x)e^{h(x)}$

(D) $h(x)e^{h(x)-1}$

67. If $f(x) = \sqrt[3]{5x^2-7}$, then $f'(x) =$

(A) $\frac{10x}{3}\left(5x^2-7\right)^{-\frac{2}{3}}$

(B) $\frac{1}{3}\left(5x^2-7\right)^{-\frac{2}{3}}$

(C) $\frac{3}{4}\left(5x^2-7\right)^{\frac{4}{3}}$

(D) $\frac{1}{3}(10x)^{-\frac{2}{3}}$

68. If $y = \sqrt{3x^2+1}$, then $\frac{dy}{dx} =$

(A) $\frac{1}{2\sqrt{6x}}$

(B) $\frac{1}{2\sqrt{3x^2+1}}$

(C) $\frac{3x}{\sqrt{3x^2+1}}$

(D) $3x\sqrt{3x^2+1}$

69. If $f(x) = \sqrt{x^4+8}$, then $f'(-1) =$

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

(B) $-\frac{2}{3}$

(C) $-\frac{1}{6}$

(D) $\frac{1}{6}$

70. If $f(x) = \sin\left(e^{3x}\right)$, then $f'(x) =$

6

(A) $\cos\left(e^{3x}\right)$

(B) $\cos\left(3e^{3x}\right)$

(C) $e^{3x}\cos\left(e^{3x}\right)$

(D) $3e^{3x}\cos\left(e^{3x}\right)$

71. If $f(x) = \left(e^{3x} + \sin(2x)\right)^4$, then $f'(x) =$

(A) $4\left(3e^{3x} + 2\cos(2x)\right)^3$

(B) $4\left(e^{3x} + \sin(2x)\right)^3\left(e^{3x} + \cos(2x)\right)$

(C) $4\left(e^{3x} + \sin(2x)\right)^3\left(3e^{3x} + 2\sin(2x)\right)$

(D) $4\left(e^{3x} + \sin(2x)\right)^3\left(3e^{3x} + 2\cos(2x)\right)$

72. Let f be the function defined by $f(x) = \sin(h(x))$, where h is a differentiable function. Which of the following is equivalent to the derivative of f with respect to x ?

(A) $\cos(h(x))$

(B) $\cos(h\prime(x))$

(C) $\cos(h(x))h\prime(x)$

(D) $\sin(h(x))h\prime(x)$

73. $\int \frac{x^2+1}{\left(x^3+3x-5\right)^3}dx =$

(A) $-\frac{3}{2}\cdot\frac{1}{\left(3x^2+3\right)^2} + C$

(B) $-\frac{1}{6}\cdot\frac{1}{\left(3x^2+3\right)^2} + C$

(C) $-\frac{3}{2}\cdot\frac{1}{\left(x^3+3x-5\right)^2} + C$

(D) $-\frac{1}{6}\cdot\frac{1}{\left(x^3+3x-5\right)^2} + C$

74. $\frac{d}{dx}\left(x^3\sec(2x)\right) =$

(A) $6x^2\sec(2x)\tan(2x)$

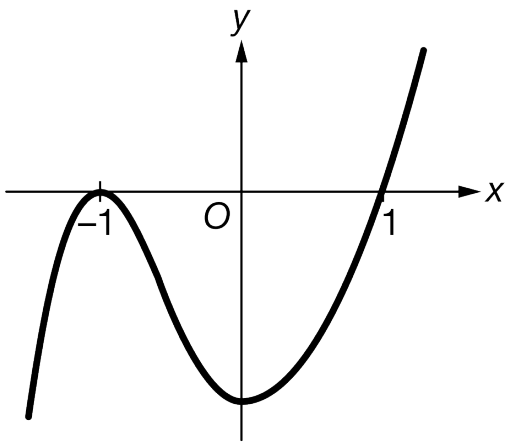
(B) $2x^3\tan^2(2x) + 3x^2\sec(2x)$

(C) $x^3\sec(2x)\tan(2x) + 3x^2\sec(2x)$

(D) $2x^3\sec(2x)\tan(2x) + 3x^2\sec(2x)$

6

75.



Graph of f

The figure above shows the graph of a differentiable function f. If $g(x) = f\left(x^2\right)$, which of the following statements is true?

(A) $g'(-1) < 0$

(B) $g'(-1) > 0$

(C) $g'(1) < 0$

(D) $g'(1) = 0$