1. The equation of the line passing through $(2 , -1)$ having slope 2 is

a) $y = - 2x - 5$ b) $y = 2x - 5$ c) $2y + x = 5$ d) $y + 2x = 5$ e) $y = 2x + 2$

2. Let $f(x) = \sqrt{(x + 2)}$ and $g(x) = x^2 + x + 1$. Then $f(g(x)) =$

a) $(x + 2) + \sqrt{(x + 2)} + 1$ b) $\sqrt{(x^2 + x + 1)}$ c) $\sqrt{(x^2 + x + 2)}$

d) $\sqrt{(x + 3)}$ e) $\sqrt{(x^2 + x + 3)}$

3. The point(s) of intersection of $y = 2x + 3$ and $g(x) = x^2 +4x - 5$ are

a) $(3,2) ; (-4, -3)$ b) $(2 , 7) ; (-4 , -5)$ c) $(2, 4) ; (2 , 1)$

d) $(0 , 1) ; (2 , 1)$ e) $(-1 , 2) ; (0 , 4)$

4. The equation of the tangent line to the curve $y = (2x - 5)^3$ at $x = 2$ is

a) $y = -6x - 13$ b) $y = 6x - 13$ c) $y = 6x + 12$ d) $y = -6x + 12$

e) $y = 6x + 11$

5. The vertical asymptotes of the curve $f(x) = (x + 2)/(x^2 - 2x - 3)$ occur at $x =$

a) -1 and 3 b) 1 and 3 c) 1 and -3 d) -1 and -3 e) 3 and 2

6. The curve $f(x) = -x^2 + 4x + 12$ has a relative maximun at $x =$

a) 0 b) -1 c) -2 d) 1 e) 2

7. The curve $f(x) = x^3 - 3x^2 + 10$ has a point of inflection at $x =$

a) 0 b) 1 c) 2 d) 3 e) 4

8. The domain of the function $g(x) = 2x / \{ (x^2 + 1)(x - 2) \}$ is

a) $x \neq 1$ b) $x \neq -1$ c) $x > 2$ d) $x \neq 2$ e) $x < 2$

9. The tangent to the curve $y = e^x + x^2 + 1$ at $x = 0$ has the equation

a) $y = x + 2$ b) $y = -x + 2$ c) $y = -x + 1$ d) $y = x + 1$ e) $y = x$

10. $e^{2(\ln 9)} =$

a) 2 b) 9 c) 81 d) 3 e) 18

11. The solution of the equation $\ln 4x + \ln x = 0$

a) 1 b) 2 c) 3 d) 1/2 e) 1/3

12. $2 \ln x - \ln 4 + \ln 8 =$

a) $\ln (4 x)$ b) $\ln (x^2)$ c) $\ln (2x^2)$ d) $4x$ e) x^2

13. Find the present value of $1000 to be obtained in four years if money can be invested
at 8% annual interest compounded continuously.

a) $\$10000/e^{0.32}$ b) $\$10000/e^{0.08}$ c) $\$1000e^{0.32}$ d) $\$1000e^{0.08}$ e) $1000/1.32

14. Find the production level x that results in maximun revenue if the demand equation

for a product is $p = 6 - (1/2)x$.

a) 6 b) 1/2 c) 3 d) 12 e) 1/12

15. Let $f(x) = \ln\{(x+1)(2x+1)^3(x^2+3)\}$. Then $f'(x) =$

a) $1/(x+1) + 1/(2x+1)^3 + 1/(x^2+3)$ b) $1/\{(x+1)(2x+1)^3(x^2+3)\}$

c) $1/(x+1) + 6/(2x+1) + 2/(x^2+3)$ d) $1/(x+1) + 6/(2x+1)$

e) $1/(x+1) + 6/(2x+1) + 2x/(x^2+3)$

16. Let $y = (2x-1)e^{3x}$. Then $dy/dx\,|_{x=1} =$

a) e^3 b) $2e^3$ c) $3e^3$ d) $4e^3$ e) $5e^3$

17. Let $y = x/(x+1)$. Then $d^2y/dx^2 =$

a) 0 b) $1/(x+1)^3$ c) $-1/(x+1)^3$ d) $-2/(x+1)^3$

e) $2/(x+1)^3$

18. Let $y = e^{x^2} \ln x$. Then $dy/dx =$

a) e^{x^2} b) $2x\ e^{x^2}\ \ln x + e^{x^2}\ /\ x$ c) $2xe^{x^2}\ /\ \ln x$ d) $2xe^{x^2}$ / x

e) $e^{x^2}\ \ln x$

19. On which of the following intervals is the curve $y = x^3 - 3x^2 + 5$ concave up ?

a) (-4 , -1) b) (-1 , 1) c) (0, 2) d) (1, 2) e) (3 , 7)

20. Let $s(t) = 2t^2 - 3t + 10$ be the distance function of a particle at time t. Find the acceleration at $t = 2$.

a) 2 b) 3 c) 4 d) 6 e) 10

21. $\int (3x^2 - 1/x)\, dx =$

a) $x^3 - \ln|x|$ b) $x^3 + \ln|x|$ c) $3x^3 - \ln|x|$ d) $3x^3 + \ln|x|$

e) $x^3 \ln|x|$

22. $\int^3 (e^{2x} + 2x)\, dx =$

a) $1/2 (e^6 - e^2) + 8$ b) $(e^6 - e^2) + 7$ c) $e^6 - e^2 + 4$

d) $e^6 - e^2 + 5$ e) $e^6 - e^2 + 6$

23. Find the area under the curve $y = (2x - 1)^2$ from $x = 0$ to $x = 2$.

a) 9 b) 9 /2 c) 3/2 d) 3 e) 6

24. Find the function $f(x)$ such that $f'(x) = x + x^2$ and $f(0) = 1$

a) $x + x^2 + 1$ b) $x^2 + x^3 + 1$ c) $1/2\ x^2 + 1/3x^3$

d) $1/2\ x^2 + 1/3x^3 + 1$ e) $1/2\ x^2 + 1/3x^3 + 10$

25. $\int e^{-3x}\,dx =$

a) $(e^3 - e^{-3})$ b) $1/3(e^3 - e^{-3})$ c) $1/2\ (e^3 - e^{-3})$

d) $2(e^3 - e^{-3})$ e) $3(e^3 - e^{-3})$