1. x = 1 için

$f'(1) = g'(1)$

$f'(x) = 3x^2 - 6x$

$g'(x) = ax^2 + 2bx$

$f'(1) = -3$
$g'(1) = a + 2b$ } $\boxed{a + 2b = -3}$

x = –1 için

$f'(-1) = 9$

$g'(-1) = a - 2b$

$a - 2b = 9$
$+ \quad a + 2b = -3$
$2a = 6$
$\boxed{a = 3}$

$a - 2b = 9$
$3 - 2b = 9$
$-6 = 2b$
$\boxed{-3 = b}$ } $\boxed{a + 2b = -3}$

Cevap: B

2. $-\frac{fx}{fy} = -\frac{3x^2 + y + 3}{2y + x - 2}$ olur.

x = 1 , y = –1 yazalım

$$-\frac{3.1^2 - 1 + 3}{2(-1) + 1 - 2} = -\frac{3 - 1 + 3}{-2 + 1 - 2} = -\frac{5}{-3}$$

$$= \frac{5}{3}$$

Cevap: E

3. $f(x) = x\ln(x^2)$

$f'(x) = 1.\ln(x^2) + \frac{2x}{x^2} \cdot x$

$f'(x) = \ln(x^2) + 2$

Cevap: D

4. $f'(x) = \frac{\frac{1}{2\sqrt{x}} \cdot e^{2x} - 2e^{2x}.\sqrt{x}}{(e^{2x})^2}$

$f'(1) = \frac{\frac{1}{2} \cdot e^2 - 2.e^2}{e^4}$

$$= \frac{e^2 - 4a^2}{2e^4} = -\frac{3e^2}{2e^4} = -\frac{3}{2}e^{-2}$$

Cevap: D

5. $\frac{dy}{dx} = \frac{\frac{dy}{dx}}{\frac{dx}{dt}} = \frac{3x2}{2x} = \frac{3}{2}t$

$$\left.\frac{d\left(\frac{3}{2}t\right)}{dx}\right|_{t=1} = \frac{\frac{3}{2}}{2t} = \frac{\frac{3}{2}}{2.1} = \frac{3}{4}$$

Cevap: D

6. x = 2 için

f(x) = x – 1 – x + 1 = 0

$f'(x) = 0 \Rightarrow f'(2) = 0$

x = –2 için

f(x) = x – 1 + x – 1 = 2x

f'(x) = 2

f'(–2) = 2

Cevap: B

7. $y^3 + 3x^3 - 1 + xy = 0$

$$\frac{Fx}{Fy} = -\frac{9x^2 + y}{3y^2 + x}$$

$x = 1$ için $\quad y^3 + 3 - 1 + y = 0$

$$y^3 + y = -2$$

$$\boxed{y = -1}$$

$$\left.\frac{Fx}{Fy}\right|_{\substack{x=1\\y=-1}} = -\frac{9.1 - 1}{3(-1)^2 + 1} = -\frac{8}{4} = -2$$

Cevap: C

8. $f'(x) = 3\left(\frac{x+1}{x+2}\right)^2 . \left(\frac{1.(x+2) - 1(x+1)}{(x+2)^2}\right)$

$$f'(1) = 3.\left(\frac{2}{3}\right)^2 . \left(\frac{3-2}{3^2}\right)$$

$$= \cancel{3} \cdot \frac{4}{\cancel{9}_3} \cdot \frac{1}{9} = \frac{12}{81} = \frac{4}{27}$$

Cevap: A

9. $g'(x) = 2x.f(1 - 2\sqrt{x}) + f'(1 - 2\sqrt{x}).\frac{-2}{2\sqrt{x}} \cdot x^2$

$$g'(4) = 2.4.f(1 - 2\sqrt{4}) + f'(1 - 2\sqrt{4}).\frac{-1}{2\sqrt{4}} \cdot 4^2$$

$$= 8.f(-3) + f'(-3) \cdot \frac{-1}{4} \cdot 16$$

$$= 8.f(-3) - 8f'(-3) = 0$$

Cevap: C

10. $f(x^3) = x^2 - 16x + 4$

$f'(x^3).3x^2 = 2x - 16$

$f'(8).3.4 = 2.2 - 16$

$f'(8).12 = -12$

$f'(8) = -1$

Cevap: A

11. $f(x) = e^{2x+1}$

$y = e^{2x+1}$

$x = e^{2y+1}$

$\log_e x = 2y + 1$

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

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

$$(f^{-1})'(7) = \frac{1}{2} \cdot \frac{1}{7} = \frac{1}{14}$$

Cevap: A

12. $\frac{Fx}{Fy} = -\frac{3y + 2}{3x - 1}$

$x = 2$ için

$3.2.y + 2.2 - y + 7 = 0$

$5y + 11 = 0$

$$y = -\frac{11}{5}$$

$$-\frac{Fx}{Fy} = -\frac{3.\left(-\frac{11}{5}\right) + 2}{3.2 - 1} = -\frac{\frac{-33}{5} + 2}{5}$$

$$= -\frac{\frac{-23}{5}}{5} = +\frac{23}{25}$$

Cevap: B

13. $f'(x) = 3(2x - 3)^2.2 + \frac{4}{2\sqrt{x}}$

$$= 6(2x - 3)^2 + \frac{2}{\sqrt{x}}$$

$$f'(4) = 6(2.4 - 3)^2 + \frac{2}{\sqrt{4}}$$

$$= 6.5^2 + \frac{2}{2} = 151$$

Cevap: E

14. $y^{I} = 3(2x + 5)^2.2$

$y^{II} = 6.2(2x + 5)^{I}.2$

$y^{III} = 24.2 = 48$

Cevap: E

15. $f^{II}(x) = 5x + 3$ için integral alalım.

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

$f^{I}(0) = c = 5$

$f^{I}(x) = \frac{5x^2}{2} + 3x + 5$ için integral alalım.

$f(x) = \frac{5x^3}{6} + \frac{3x^2}{2} + 5x + c$

$f(0) = c = -1$

$f(x) = \frac{5x^3}{6} + \frac{3x^2}{2} + 5x - 1$

$f(1) = \frac{5}{6} + \underset{(3)}{\frac{3}{2}} + \underset{(6)}{\frac{4}{1}} = \frac{5+9+24}{6} = \frac{19}{3}$

Cevap: D

16. $f^{I}(x) = 2x.(x^3 - 2x) + (3x^2 - 2)(x^2 + 2)$

$f^{I}(-1) = 2(-1)(-1 + 2) + (3.1 - 2)(1 + 2)$

$= -2.1 + 1.3 = 1$

Cevap: C

17. $f^{I}(3x - 2).3 = 15x^2 + 6x$

$f^{I}(3.2 - 2).3 = 15.2^2 + 6.2$

$f^{I}(4).3 = 60 + 12$

$f^{I}(4).3 = 72$

$f^{I}(4) = 24$

Cevap: A

18. $f^{I}(x) = 2x + 1$ integral alalım.

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

$f(1) = \frac{2.1}{2} + 1 + c = 4$

$c = 2$

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

$f(2) = \frac{2.2^2}{2} + 2 + 2$

$f(2) = \frac{2.2^2}{2} + 2 + 2 = 8$

Cevap: D

19. $f^{II}(x) = 3x - 1$ integral alalım

$f^{I}(x) = \frac{3x^2}{2} - x + c$

$f^{I}(0) = c = 4$

$f^{I}(x) = \frac{3x^2}{2} - x + 4$ integral alalım.

$f(x) = \frac{3x^3}{6} - \frac{x^2}{2} + 4x + c$

$f(0) = c = 1 \Rightarrow f(1) = \frac{3}{6} - \frac{1}{2} + 4 + c = 5$

Cevap: D

20. $f^{I}(1 - 2x).(-2) = 6x + 1$

$f^{I}(1 - 2.0)(-2) = 1$

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

Cevap: B