1. $g(-4) = \dfrac{f(-4)}{3} + 2$

$= \dfrac{\sqrt{|-4|} - \frac{1}{3}}{3} + 2$

$= \dfrac{2 - \frac{1}{3}}{3} + 2 = \dfrac{5}{9} + 2 = \dfrac{23}{9}$

Cevap: D

2. $f(1) = 1$

$f(2) = 1f(1) = 1.1 = 1!$

$f(3) = 2.f(2) = 2.1 = 2!$

$f(4) = 3.f(3) = 3.2.1 = 3!$

$\vdots$

$f(101) = 100!$

Cevap: B

3. $\lim\limits_{x \to 1^+} ax + b = \lim\limits_{x \to 1^-} x^2 + x - 1$

$a + b = 1 + 1 - 1$

$a + b = 1$

Cevap: B

4. $f(x) = \dfrac{x}{x-1} + \dfrac{2}{x(1-x)}$

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

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

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

$f^{-1}\left(\dfrac{x^2-2}{x(x-1)}\right) = x \Rightarrow \dfrac{x^2-2}{x(x-1)} = 1$

$x^2 - 2 = x^2 - x$

$\boxed{x = 2}$

Cevap: B

5. $f(-1) = \underbrace{1-1}_{0} + \underbrace{1-1}_{0} + \underbrace{1-1}_{0} + \ldots + 1 + 4$

$f(-1) = 1 + 4 = 5$

Cevap: E

6. $f(x + 1) = 2.9(x - 1)$

$f(x + 1) = 2.(x - 1 - 1)$

$f(x + 1) = 2x - 4$

$f(x - 1 + 1) = 2(x - 1) - 4$

$f(x) = 2x - 6$

$f^{-1}(x) = \dfrac{x+6}{2}$

$(gof^{-1})(x) = g(f^{-1}(x)) = g\left(\dfrac{x+6}{2}\right)$

$= \dfrac{x+6}{2} - 1 = \dfrac{x+4}{2}$

Cevap: D

7. $f(x) - 1 = 3^x$

$f(x - 1) = 3^{x-1} + 1 = 3^x \cdot \dfrac{1}{3} + 1$

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

Cevap: D

8. $(g^{-1}of^{-1})^{-1}(x) = (fog)(x)$

$= f(g(x)) = f(2(x - 1) - 3)$

$= f(2x - 5) = \dfrac{1}{2x-5}$

Cevap: B

9. $f(x) = 3^x + 1 \Rightarrow f(x) - 1 = 3^x$

$f(x+1) = 3^{x+1} + 1 = 3^x.3 + 1$

$= (f(x) - 1).3 + 1 = 3f(x) - 2$

Cevap: D

10. $(f(x)+1)\frac{3}{2} = 3^x$

$f(2x-1) = 2.3^{2x-1-1} - 1 = 2.3^{2x-2} - 1$

$= 2.(3^x)^2.\frac{1}{9} - 1$

$= 2\left(\frac{3}{2}(f(x)+1)\right)^2.\frac{1}{9} - 1$

$= 2.\frac{9}{4}.(f^2(x)+2f(x)+1).\frac{1}{9} - 1$

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

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

Cevap: D

11. $f(3) = \frac{1}{2-1} = 1$

$f(4) = \frac{1}{3+1} = \frac{1}{4}$

$\Big\} \; 1 + \frac{1}{4} = \frac{5}{4}$

Cevap: C

12. $f^{-1}\left(\frac{x}{4} - 1\right) = 1 + \frac{x}{2}$

$(gof^{-1})(2) = g(f^{-1}(2))$

$= g\left(1 + \frac{12}{2}\right) = g(7)$

$= 2.7 - 3 = 11$

Cevap: C

13. $(gof)(x) = g(f(x)) = x - \sqrt{x}$

$= g(\sqrt{x}) = x - \sqrt{x}$

$= g(\sqrt{x^2}) = x^2 - \sqrt{x^2}$

$= g(x) = x^2 - x$

Cevap: E

14. $(g^{-1}of)(x) = x^2 + 3$

$g^{-1}(f(x)) = x^2 + 3$

$g(x^2 + 3) = f(x)$

$x^2 = 0 \Rightarrow x = 0$

$g(3) = f(0) = 0 + 1 = 1$

Cevap: C

15. $11[f(1) + f(2) + \ldots + f(10)]$

$11\left[\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \ldots + \frac{1}{10.11}\right]$

$11\left[\frac{1}{1} - \frac{1}{2} + \frac{1}{2} - \frac{1}{3} + \frac{1}{3} - \frac{1}{4} + \ldots + \frac{1}{10} - \frac{1}{11}\right]$

$11\left[\frac{1}{1} - \frac{1}{11}\right] = 11 - 1 = 10$

Cevap: C

16. $f(x + 1 - 1) = 2(x + 1) + 3$

$f(x) = 2x + 5$

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

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

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

$g\left(3.\frac{x+1}{3} - 1\right) = \frac{\frac{x+1}{3} - 5}{2}$

$g(x) = \frac{x-14}{6}$

Cevap: D

17. $g^{-1}(x) = \frac{x+3}{2}$

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

$2.x.f(x-1) - f(x-1) = x - 2$

$2.x.f(x-1) - x = f(x-1) - 2$

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

$g^{-1}(x) = \frac{\frac{f(x-1)-2}{2.f(x-1)-1}+3}{2} = \frac{f(x-1)-2+6f(x-1)-3}{4.f(x-1)-2}$

$= \frac{7.f(x-1)-5}{4f(x-1)-2}$

Cevap: B

18. $\left.\begin{matrix} f(-5) = a+5 \\ f(4) = 4-a^2 \end{matrix}\right\}$ $a + 5 = 4 - a^2 - a$

$a^2 + 2a + 1 = 0$

$(a+1)^2 = 0$

$a = -1$

$f(a+7) = f(6) = 4 - a = 4 + 1 = 5$

Cevap: D

19. $f^{-1}(g(x)) = x^3 + 10$

$f^{-1}(2x+5) = x^3 + 10$

$f(x^3 + 10) = 2x + 5$

$x = -2$

$f(2) = 2(-2) + 5 = 1$

Cevap: B

20. $f(4x+3) = \frac{2x+1}{x-1}$

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

Cevap: C