

16. If  $f(x) = \sqrt[3]{x-1} + 1$ , what is the y-intercept of the graph of  $f^{-1}(x)$

- A. 0
- B. 1
- C. 2
- D. 3
- E. 3.3

17. If  $f(x) = 2x - 5$  and  $g(x) = \frac{1}{6+x}$  then  $fg(2) =$

- A. 29
- B.  $\frac{1}{8}$
- C.  $\frac{29}{18}$
- D. 47
- E.  $-\frac{1}{8}$

18.. If  $f(x) = \sqrt[3]{2x^3 - 5}$  then  $f^{-1}(2.5) =$

- A. 2.37
- B. 5.12
- C. 2.97
- D. 1.74
- E. 2.18

19. If, for all real numbers  $x$ ,  $f(4x - 8) = x - 2$  then  $f(x) =$

- A.  $\frac{x}{4}$
- B.  $4x - 4$
- C.  $\frac{x}{2} + 2$
- D.  $\frac{x}{2} - 2$
- E.  $2x - 4$

20. If  $f(x) = \sqrt[3]{x}$  and  $f(g(x)) = -\sqrt{x}$  then  $g(x) =$

- A.  $4x$
- B.  $2x$
- C.  $2x^2$
- D.  $\frac{x}{2}$
- E.  $-x^3$

21. If  $f(x) = \frac{x+1}{3}$  what is  $f^{-1}(3f(2)) =$

- A. 0
- B. 2
- C. 6
- D. 8
- E. 12

22. Anne and Barbara together can do a job in 3 days; Barbara and Connie can do it in 4 days; and Anne and Connie can do it in  $\frac{30}{7}$  days. The number of days it would take Anne to do the job alone is:

- A. 1
- B. 3
- C. 6
- D. 12
- E. 2.8

23. Which of the following does not describe a function which has a proper inverse?

- A. It passes the vertical line test
- B. It passes the horizontal line test
- C. It is one-to-one
- D. It can be symmetric about the y-axis
- E. They all describe a function with an inverse

24. Suppose  $f(a+b+c) = f(a) + f(b) + f(c) - 4$ , what is  $f(0)$ ?

- A. 0
- B. 1
- C. 2
- D. 3
- E. None of these

25. Given that  $f\left(\frac{x}{a}\right) = \frac{f(x)}{a}$  for all real numbers  $a$  and  $f(4) = 12$  find  $f(6)$

- A. 15
- B. 18
- C. 21
- D. 24
- E. None of these

26. Find  $f(x)$  if  $f(x) + 5f\left(\frac{1}{x}\right) = 3$

- A. 2
- B. 3
- C. 7
- D. 9
- E. None of these

27. Let  $\{x\} = x - [x]$  denote the fractional part of  $x$ . If  $z = \frac{2\{\sqrt{2}\}^2}{\{\sqrt{3}\}}$  what is  $[z]$

- A. 0
- B. 1
- C. 2
- D. 3
- E. None of these

28. If  $f(3x - 1) = 36x^2 - 33x + 14$  then  $f(x)$  is some polynomial. What is the sum of the coefficients of that polynomial?

- A. 10
- B. 12
- C. 14
- D. 15
- E. None of These

29. If  $f(n + 1) = (-1)^{n+1}(n - 2)f(n)$  for all integers greater than 0 and  $f(1) = f(1986)$ , compute  $f(1) + f(2) + f(3) + \dots + f(1985)$

- A. 300
- B. 311
- C. 321
- D. 331
- E. None of These

30. If  $f(x) = x^2 + x - 1$  for  $x \geq -2$  and  $g(x) = x^2 - 1$  for  $x < 5$  then what is the domain of  $f \circ g$ ?

- A.  $[-2, 5)$
- B.  $[-2, 2)$
- C.  $(-2, 2)$
- D.  $(-2, 5)$
- E. None of These