

① If $f(x) = x^3 - 2x - 1$, then $f(-2)$ is A) -17 B) -13 C) -5 D) -1 E) 3

② The domain of $f(x) = \frac{x-1}{x^2+1}$ is

- A) all $x \neq 1$ C) all $x \neq -1$ E) all reals
 B) all $x \neq -1$ or 1 D) $x \geq 1$

③ The domain of $g(x) = \frac{\sqrt{x-2}}{x^2-x}$ is

- A) all $x \neq 0$ or 1 C) $x \leq 2$ E) $x > 2$
 B) $x \leq 2$, $x \neq 0$ or 1 D) $x \geq 2$

④ If $f(x) = x^3 - 3x^2 - 2x + 5$ and $g(x) = 2$ then $g(f(x)) =$
 A) $2x^3 - 6x^2 - 4x + 10$ B) $2x^2 - 6x + 1$ C) -6 D) -3 E) 2

⑤ Write $f(g(x))$ for #4

⑥ If $f(x) = x^3 + Ax^2 + Bx - 3$ and $f(1) = 4$ while $f(-1) = -6$ then $2A + B =$
 A) 12 B) 8 C) 0 D) -2 E) not enough information

⑦ Which of the following has symmetry to the origin (odd)
 A) $\frac{x-1}{x}$ B) $2x^4 + 1$ C) $x^3 + 2x$ D) $x^3 + 2$ E) $\frac{x}{x^3 + 1}$

⑧ Let $g(x) = |\cos x - 1|$. The maximum of $g(x)$ is attained in the interval $[0, 2\pi]$ when $x =$
 A) -1 B) 0 C) $\frac{\pi}{2}$ D) 2π E) π

⑨ Which of the following functions is NOT ODD

A) $f(x) = \sin x$ B) $f(x) = \sin 2x$ C) $f(x) = x^3 + 1$ D) $f(x) = \frac{x}{x^2 + 1}$ E) $f(x) = \sqrt[3]{2x}$

⑩ The set of zeros of $f(x) = x^3 + 4x^2 + 4x$ is $x =$

- A) -2 B) 0 & -2 C) 0 & 2 D) $0, -2$ & 2 E) -2 & 2

⑪ Let $f(x)$ have an inverse function. Then $f(g(x))$ is

- A) 1 B) x C) $\frac{1}{x}$ D) $f(x) \circ g(x)$ E) not enough information

12) The function $f(x) = 2x^3 + x - 5$ has exactly one real zero. It must be between which two integers (don't use calculator)

- A) -2 and -1 B) -1 and 0 C) 0 and 1 D) 1 and 2 E) 2 and 3

13) The period of $f(x) = \frac{2\pi}{3}x$ is

- A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{3}{2}$ D) 3 E) 6

14) $\log_b(3b) = \frac{b}{2}$ then $b =$ A) $\frac{1}{9}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 3 E) 9

15) $\tan(\arccos \frac{-\sqrt{2}}{2}) =$ A) -1 B) $-\frac{\sqrt{3}}{3}$ C) $-\frac{1}{2}$ D) $\frac{\sqrt{3}}{3}$ E) 1

OPEN

Write the inverse function for

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

17) $f(x) = 2e^{-x}$

18) A function and its inverse have symmetry to _____

Given $f(x) = \ln x$ and $g(x) = 9 - x^2$

19) Write the domain of $f(x)$

20) Write the range of $f(x)$

21) Write the domain of $g(x)$

22) Write the range of $g(x)$

23) Write the domain of $f(g(x))$

24) Write the range of $f(g(x))$

25) $y = \frac{x-2}{x^2-4}$ A) Discuss the discontinuities of this graph (all asymptotes and removable discontinuities)

B) Construct the graph

C) Write the domain

D) Write the range

26) $f(x) = \begin{cases} 3x+1 & x < 2 \\ x^2+3 & x \geq 2 \end{cases}$

Is this piece function continuous for all x ? Discuss

27) Given $\log 2 = .3010$ $\log 3 = .4771$ and $\log 5 = .6990$ Find (NO CALCULATOR)

A) $\log 10$

D) $\log 1.5$

B) $\log 12$

E) $\log 2.5$

C) $\log 150$

F) $\log 5000$

28) Circle all TRUE STATEMENTS

A) $\log 49 = 2 \log 7$

G) $\frac{x^4 - 4x^3 - 7x^2 + 22x + 24}{x-3} = x^3 - x^2 - 10x - 8$

B) $2^x = 12$ equals $x = \frac{\log 12}{\log 2}$

H) $\arccos\left(\frac{-\sqrt{2}}{2}\right) = \frac{3\pi}{4}$

C) $\tan \frac{\pi}{6} = \sqrt{3}$

I) $f(x) = \begin{cases} x+1 & -2 < x < 0 \\ 2 & x = 0 \\ -x & 0 < x < 2 \\ 0 & x = 2 \\ x-4 & 2 < x \leq 4 \end{cases}$

D) $\sin^2 x + \cos^2 x = 1$

E) $\sqrt[3]{x-2} = (x-2)^{\frac{1}{3}}$

has a jump discontinuity at $x=0$
a removable discontinuity at $x=2$
and is defined for all x in the interval $(-2, 4]$

F) Even functions have symmetry to the y -axis