Math Level 2 SAT Practice Test 11

1. To be continuous at $x = 1$, the value of $\frac{x^4 - 1}{x^3 - 1}$ must be defined to be equal to

A. -1

B. 0

C. 1

D. $\frac{4}{3}$

E. 4

2. If $f(x) = \begin{cases} \frac{3x^2 + 2x}{x} & \text{when } x \neq 0 \\ k & \text{when } x = 0 \end{cases}$, what must the value of k be equal to in order for $f(x)$ to be a continuous function?

A. $-\frac{3}{2}$

B. $-\frac{2}{3}$

C. 0

D. 2

E. No value of k can make $f(x)$ a continuous function.

3. $\lim_{x \to 2} \left(\frac{x^3 - 8}{x^4 - 16} \right) =$

A. 0

B. $\frac{3}{8}$

C. $\frac{1}{2}$

D. $\frac{4}{7}$

E. This expression is undefined.

4. $\lim_{x\to\infty}\left(\frac{5x^2-2}{3x^2+8}\right)=$

A. $-\frac{1}{4}$

B. 0

C. $\frac{3}{11}$

D. $\frac{5}{3}$

E. ∞

5. Which of the following is the equation of an asymptote of $y=\frac{3x^2-2x-1}{9x^2-1}$?

A. $x=-\frac{1}{3}$

B. $x = 1$

C. $y=-\frac{1}{3}$

D. $y=\frac{1}{3}$

E. $y = 1$

6. If {(3,2),(4,2),(3,1),(7,1),(2,3)} is to be a function, which one of the following must be removed from the set?

A. (3,2)

B. (4,2)

C. (2,3)

D. (7,1)

E. none of the above

7. For $f(x) = 3x^2 + 4$, $g(x) = 2$, and $h = \{(1,1), (2,1), (3,2)\}$,

A. *f* is the only function

B. *h* is the only function

C. *f* and *g* are the only functions

D. *g* and *h* are the only functions

E. *f, g,* and *h* are all functions

8. What value(s) must be excluded from the domain of $f = \left\{(x,y): y = \frac{x+2}{x-2}\right\}$?

A. -2

B. 0

C. 2

D. 2 and -2

E. no value

9. If $f(x) = 3x^2 - 2x + 4$, $f(-2)$ =

A. -12

B. -4

C. -2

D. 12

E. 20

10. If $f(x) = 4x - 5$ and $g(x) = 3^x$, then $f(g(2))$ =

A. 3

B. 9

C. 27

D. 31

E. none of the above

11. If $f(g(x)) = 4x^2 - 8x$ and $f(x) = x^2 - 4$, then $g(x)$ =

A. $4 - x$

B. x

C. $2x - 2$

D. $4x$

E. x^2

12. What values must be excluded from the domain of $\left(\frac{f}{g}\right)(x)$ if $f(x) = 3x^2 - 4x + 1$ and $g(x) = 3x^2 - 3$?

A. 0

B. 1

C. 3

D. both ±1

E. no values

13. If $g(x) = 3x + 2$ and $g(f(x)) = x$, then $f(2) =$

A. 0

B. 1

C. 2

D. 6

E. 8

14. If $p(x) = 4x - 6$ and $p(a) = 0$, then $a =$

A. -6

B. $-\frac{3}{2}$

C. $\frac{3}{2}$

D. $\frac{2}{3}$

E. 2

15. If $f(x) = e^x$ and $g(x) = \sin x$, then the value of $(f \circ g)(\sqrt{2})$ is

A. -0.01

B. -0.8

C. 0.34

D. 1.8

E. 2.7