Calculus Placement Review

1. Given $f(x)=5x+11$ and $g(x)=3x-4$ find the composite function $y=(f\circ g)(x)$

(a) $y=-x-2$ (b) $y=6x+9$ (c) $y=15x-9$ (d) $y=9x-11$ (e) none of these

2. Solve the system $\begin{cases}3x+y=1\\2x-3y=2\end{cases}$

(a) $x=1,\ y=1$ (b) $x=2,\ y=3$ (c) $x=1,\ y=-1$ (d) $x=-1,\ y=1$ (e) none of these

3. If $f(x)=x^3$, find $f(a)$

(a) Undefined (b) a^3 (c) $3a$ (d) a (e) none of these

4. If $f(x)=x^3$, find $f(x+h)$

(a) $x+h$ (b) x^3+h^3 (c) $x^3+x^2h+xh^2+h^3$ (d) $x(x+h)$ (e) none of these

5. If $f(x)=x^3$, find $\dfrac{f(x+h)-f(x)}{h}$

(a) 1 (b) $\dfrac{(x^3+h^3)}{h}$ (c) $3x^2+3xh+h^2$ (d) $3x^2+h$ (e) none of these

6. A ball is thrown into the air from the surface of the moon. The height of the ball at time t is given by $H(t)=-10t^2+70t$. When will the ball hit its maximum height?

(a) $t=-1$ (b) $t=2$ (c) $t=4$ (d) $t=3.5$ (e) none of these

7. Solve the equation $\log_2(x-1)+\log_2(x+2)=5$

(a) $x=-3$ (b) $x=1$ (c) $x=5$ (d) $x=2$ (e) none of these

8. Let $f(x)=-3\cos(2x-2)+1$. Find the amplitude.

(a) –3 (b) $\dfrac{\pi}{2}$ (c) 3 (d) 1 (e) none of these

9. Let $f(x)=-3\cos\left(x-\dfrac{\pi}{2}\right)+1$. Find the length of the fundamental period.

(a) $0\le x\le 2\pi$ (b) $-2\pi\le x\le 0$ (c) $\dfrac{\pi}{4}\le x\le\dfrac{5\pi}{4}$ (d) $0\le x\le\dfrac{\pi}{2}$ (e) none of these

10. Let $f(x)=-3\cos\left(x-\dfrac{\pi}{2}\right)+1$. Find the horizontal translation.

(a)left $\dfrac{\pi}{6}$ (b) right $\dfrac{\pi}{2}$ (c) left $\dfrac{\pi}{2}$ (d) right 1 (e) none of these

11. Let $f(x)=-2\cos\left(x-\dfrac{\pi}{4}\right)+1$. Find the vertical translation.

(a) left 1 (b) up $\dfrac{\pi}{4}$ (c) down 1 (d) down $\dfrac{\pi}{4}$ (e) none of these

12. Find all solutions to the equation: $\sin^2 x+2\cos x=1+\cos^2 x$

(a) $x=\dfrac{\pi}{2},\dfrac{3\pi}{2}$ (b) $\cos x=0$ (c) $\cos x=1$ (d) $x=\dfrac{\pi}{2}+n\pi$ (e) none of these

13. Solve the system $\begin{cases} x+2y=1 \\ 2x-y=-3 \end{cases}$

(a) $x=3,\ y=1$ (b) $x=2,\ y=2$ (c) $x=0,\ y=1$ (d) $x=-1,\ y=1$ (e) none of these

14. Find the value of $\cos\frac{\pi}{4}$

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{2}}{2}$ (c) $\frac{1}{3}$ (d) 0 (e) none of these

15. Solve the equation $3^{2x-1}=9^{3x+2}$

(a) $x=-3$ (b) $x=1$ (c) $x=-\frac{5}{4}$ (d) $x=\frac{1}{9}$ (e) none of these

16. Find all solutions to the equation: $\tan^2 x+\cos^2 2x=\sec^2 x-2\sin^2 x$

(a) All real numbers (b) $\cos x=0$ (c) $\cos x=1$ (d) $x\neq\frac{\pi}{2}+n\pi$ (e) none of these

17. Given $f(x)=x^2+2$ and $g(x)=2x-1$ find the composite function $y=(f\circ g)(x)$

(a) $y=x^2-1$ (b) $y=2x^2+3$ (c) $y=4x^2-4x+3$ (d) $y=4x^2-4x+1$ (e) none of these

18. Find the value of $\tan\frac{\pi}{4}$

(a) $\frac{\sqrt{3}}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) 1 (d) 0 (e) none of these

19. Find the inverse function of $f(x)=5x+9$

(a) $y=5x-9$ (b) $y=5x^2+9$ (c) $y=5x-3$ (d) $\frac{1}{5}x-\frac{9}{5}$ (e) none of these

20. Find the domain of $f(x)=\tan^{-1}2x$

(a) All real numbers (b) $-\frac{\pi}{4}<x<\frac{\pi}{4}$ (c) $-\frac{\pi}{4}\le x\le\frac{\pi}{4}$ (d) $0<x<\frac{\pi}{2}$ (e) none of these

21. If $f(x)=e^{-2x}$, find $f(-\pi)$

(a) $e^{-2\pi}$ (b) e^{π} (c) e^{2} (d) $e^{\frac{-\pi}{2}}$ (e) none of these

22. Find the range of $f(x)=-3\sin 2x$

(a) $-3<x<3$ (b) $-2<x\le 2$ (c) $-3\le x\le 3$ (d) $0<x<3$ (e) none of these

23. Solve the equation $\log_2(x-1)+\log_2(x+3)=4$

(a) $x=-3$ (b) $x=1$ (c) $-1\pm 2\sqrt{5}$ (d) $x=2$ (e) none of these

24. Find the domain of $f(x)=\ln(2x-1)$

(a) All $x>\frac{1}{2}$ (b) All $x>0$ (c) $0<x<2$ (d) $0<x<\frac{1}{2}$ (e) none of these