

Original Functions	Rewrite	Differentiate	Simplify
25. $y = \frac{5}{2x^2}$			
26. $y = \frac{2}{3x^2}$			
27. $y = \frac{3}{(2x)^3}$			
28. $y = \frac{\pi}{(3x)^2}$			
29. $y = \frac{\sqrt{x}}{x}$			
30. $y = \frac{4}{x^{-3}}$			

Find the Derivative:

19.  $y = \frac{\pi}{2} \sin \theta - \cos \theta$

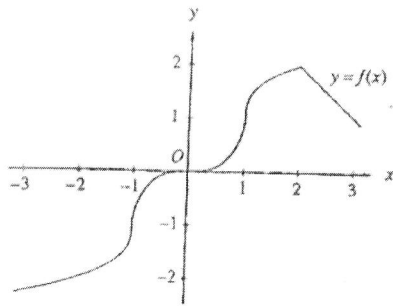
21.  $y = x^2 - \frac{1}{2} \cos x$

23.  $y = \frac{1}{x} - 3 \sin x$

20.  $g(t) = \pi \cos t$

22.  $y = 5 + \sin x$

24.  $y = \frac{5}{(2x)^3} + 2 \cos x$



2.2

3. The graph of the function  $f$  shown in the figure above has vertical tangents at  $(-1, -1)$  and  $(1, 1)$  and a horizontal tangent at  $(0, 0)$ . For what values of  $x$ ,  $-3 < x < 3$ , is  $f$  not differentiable?
- (A) 2 only  
 (B) 0 and 2 only  
 (C) -1 and 1 only  
 (D) -1, 1, and 2 only  
 (E) -1, 0, 1, and 2

37.  $\lim_{h \rightarrow 0} \frac{\sin\left(\frac{5\pi}{6} + h\right) - \frac{1}{2}}{h}$

- (A)  $\frac{\sqrt{3}}{2}$       (B)  $\frac{1}{2}$       (C) 0      (D)  $-\frac{1}{2}$       (E)  $-\frac{\sqrt{3}}{2}$

1. If  $f(x) = 5x^{\frac{4}{3}}$ , then  $f'(8) =$

- (A) 10      (B)  $\frac{40}{3}$       (C) 40      (D) 80      (E)  $\frac{160}{3}$

45. If  $f(x)$  is continuous and differentiable and  $f(x) = \begin{cases} ax^4 + 5x; & x \leq 2 \\ bx^2 - 3x; & x > 2 \end{cases}$ , then  $b =$

- (A) 0.5  
 (B) 0  
 (C) 2  
 (D) 6  
 (E) There is no value of  $b$ .