D-AD2 <u>Practice Assessment</u>

For each function below, find the derivative function.

1. $f(x) = 4\sqrt[3]{x^2} + 2x - \frac{1}{x}$

2. $g(t) = -2\cos t$

3. $y = 5^x + \csc x - \tan x$

4. $s(t) = e^{3t}$

D-AD2b

5. Find $\frac{dy}{dx}$ if $y = \sec^{-1} x$

6. If $y = \ln(5x + 1)$, find $\frac{dy}{dx}\,|_{x=1}$

7. Find the derivative of $y = \tan(3x^2 - 3)$

D-AD3

Let f(x)=$5x^2 - 3x + 5$ and g(x)=$x^2 + \cos x$

8. If $h(x) = f(x)g(x)$, find $h'(x)$. [No need to simplify.]

9. If $p(x) = \frac{f(x)}{g(x)}$, find $p'(x)$ [No need to simplify]

D-AD4

10. Calculate the derivative of y=$\sqrt[3]{6x^2 - 3x + 1}$

11. If y=$\cos^2(3x - 12)$, find $\frac{dy}{dx}$.

12. Use the table to find $h'(1)$ if $h(x) = f(g(x))$.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	1	2	3	−2
2	3	$\frac{3}{2}$	1	$-\frac{1}{2}$
3	4	$-\frac{1}{2}$	2	$\frac{3}{2}$
4	2	−2	4	2

D-CD4

13. Show that $f(x) = \begin{cases} 5x^2 - 3x - 6 & x \leq 1 \\ -2x^2 - 2 & x > 1 \end{cases}$ is not differentiable at x=1.

14. Find the values of a and b that would make f(x) differentiable. $f(x) = \begin{cases} ax^2 + bx - 2 & x \leq 2 \\ -2x^2 + 2x + 8 & x > 2 \end{cases}$

15. Use the axes below to sketch a continuous function with a corner at x=3, a cusp at x=0, and a vertical tangent at x=−2.