
Name: _____

1. $D_x \left[\cos(3x) + \ln(2) - x^\pi + e^{-x} \right] =$

2. $D_w \left[\ln(w^3 - 4w^2 - 2w + 3) \right] =$

3. $D_x \left[\frac{x}{\sqrt{x^5 - x}} \right] =$

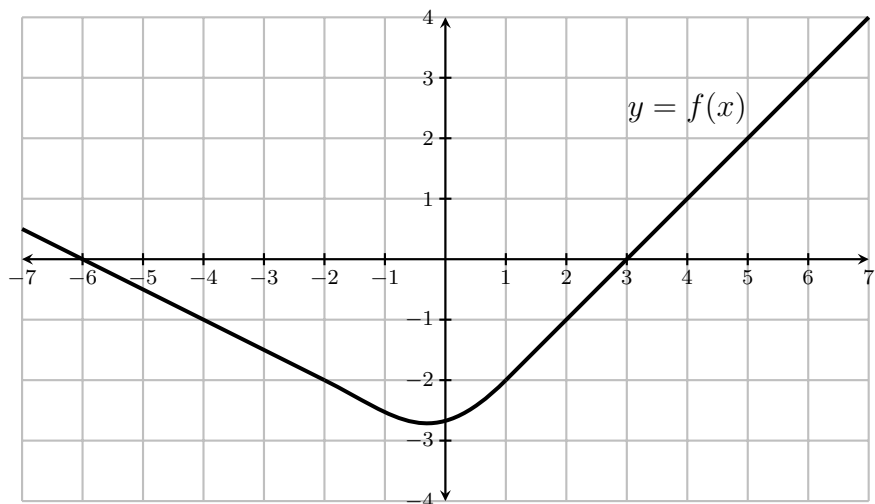
4. $D_x \left[(x^2 + \tan^{-1}(5x))^4 \right] =$

5. $D_x \left[\csc\left(\frac{\pi}{x}\right) \right] =$

6. $D_x \left[\ln(x)e^{\tan(x^2)} \right] =$

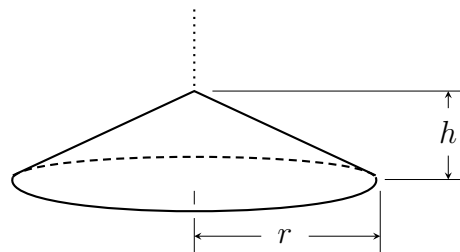
7. The graph of a function $f(x)$ is shown below.

Using the same coordinate axis, sketch the graph of its derivative $f'(x)$



8. Given the equation $y^2 + x^3 = 3xy^3$, find $\frac{dy}{dx}$.

9. Suppose it costs $C(x)$ dollars to build a transmitting tower x meters high.
Suppose it happens that $C'(60) = 1020$. Explain in simple terms what this means.
10. Sand falls at a rate of 4 cubic feet per minute, making a conical pile whose height h is always half its radius r . Find the rate of change of the radius r (in feet/min) when $r = 2$ feet.



Geometry formula: The volume of a cone is $V = \frac{1}{3}\pi r^2 h$.