

1. Integrate.

(a) $\int_1^2 \left(\frac{2}{x} + \frac{x}{2} \right) dx$

(b) $\int_1^2 \left(\frac{\pi^2}{x^2} - e^x \right)$

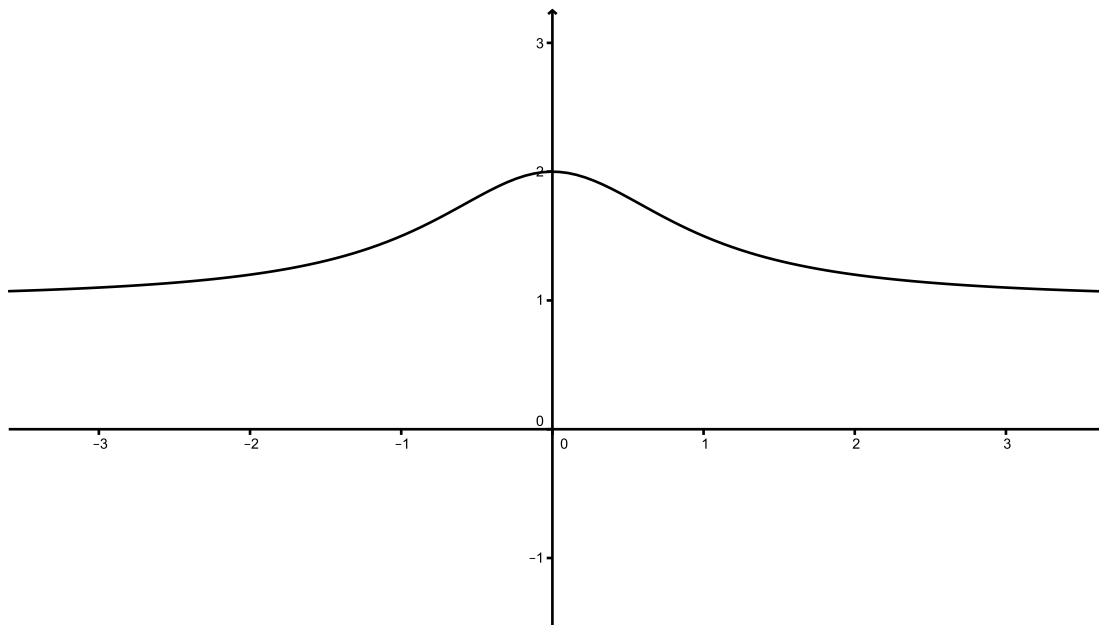
(c) $\int_1^4 \frac{3x - 4}{\sqrt{x}} dx$

2. Find $\frac{dy}{dx}$ at (1, 1) for the curve $\frac{y}{x} + e^{xy} = e^y + x$.

3. At what point on the graph of $f(x) = \frac{9}{x} + 6 \ln x$ is the tangent line parallel to the line $y = x - 5$?

4. A boat is pulled toward a pier by means of a taut cable. If the boat is 20 ft. below the level of the pier and the cable is pulled in at the rate of 36 ft/min, how fast is the boat moving when it is 48 feet from the base of the pier?

5. Use the graph of f , shown below, to find the following.



(a) $\lim_{x \rightarrow \infty} f(x)$

(b) $\lim_{x \rightarrow \infty} f'(x)$

(c) $f'(1)$

(d) Find a value of x for which $f'(x) = \frac{1}{2}$.

(e) For what approximate values of x is the graph of f concave downward?

(f) Find a value of x for which $f'(x) < 0$ and $f''(x) > 0$.

(g) Where are the inflection points on the graph?