

6. We need to fence in a rectangular area next to the store containing 1600 square feet (we put fence on 3 sides). The fence along the side parallel to the building costs \$6 per foot and the two ends each cost \$3 per foot. Find the dimensions that will minimize the total cost. (JUSTIFY!)

7. Find the absolute extrema of $f(x) = 2\sqrt{x} - x$ on the interval $[0,5]$. (Hint: there's a critical value in that interval!)

8. $\int (4x^3 + 2x - 1) dx =$

9. $\int \left(8\sqrt[3]{x} - \frac{6}{\sqrt{x}} \right) dx =$

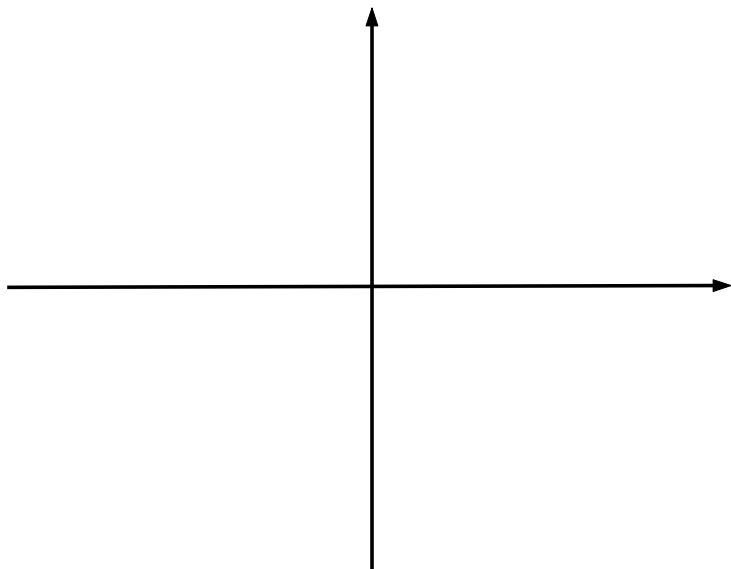
10. The price p (in dollars) the demand x for a product are related by $x^2 + 2xp + 25p^2 = 74500$. If the price is increasing at a rate of \$2 per month when the price is \$30 and the demand is 200, find the rate of change of the demand (per month).

11. For the function $g(x) = x^3(x - 12)^2$ find the sign distribution of $g'(x)$. Determine where $g(x)$ is increasing and decreasing. Find the local extrema of $g(x)$.

12. Consider the function $f(x) = \frac{4 - x^2}{x^2 + 3}$

HINT: $f'(x) = \frac{-14x}{(x^2 + 3)^2}$ and $f''(x) = \frac{42(x^2 - 1)}{(x^2 + 3)^3}$

SHOW WORK related to finding each of the following: (1) the intercepts, (2) the asymptotes, (3) the sign distribution for f' , (4) sign distribution for f'' , and THEN graph the function (plot and LABEL extreme values and inflection points).



13. The figure below shows the graph of $y = f'(x)$. (CAUTION: this is the graph of f' NOT the graph of f). Use this to construct sign charts for $f'(x)$ and $f''(x)$ and then sketch a possible graph of $f(x)$.

