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Example 1. *At ACME Anvils, output is* $Q = 60K^{\frac{1}{3}}L^{\frac{2}{3}}$ *where* K *is the capital inverstment (in thousands of dollars) and* L *is the size of the labor force, measured in worker-hours.*

Example 1. *At ACME Anvils, output is* $Q = 60K^{\frac{1}{3}}L^{\frac{2}{3}}$ *where* K *is the capital inverstment (in thousands of dollars) and* L *is the size of the labor force, measured in worker-hours. If output is kept constant, at what rate must capital investment change at a time when* $K = 8$, $L = 1000$ *and* L *is increasing at the rate of* 25 *worker-hours per week?*

Example 2. *Recall that the volume of a cylinder of height* h *and radius* r *is given by* $\pi r^2 h$, *and its surface area is* $2\pi r^2 + 2\pi r h$.

Example 2. *Recall that the volume of a cylinder of height* h *and radius* r *is given by* $\pi r^2 h$*, and its surface area is* $2\pi r^2 + 2\pi rh$*. If a can is made of alloys which cost 5 cents per square centimeter on top and bottom but 3 cents per square centimeter on the sides, find the cheapest way to make a can which will hold 200 cubic centimeters.*

Example 3. *Sketch the graph of a function* $f(x)$ *with the following properties: the limit of* $f(x)$ *as* $x \to \infty$ *is* -1 *and as* $x \to -\infty$ *is* 5*;*

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Example 4. *Maximize profit when the price at which* q *units can be sold is* $p(q) = 25 - q$ *and it costs \$10 to produce each unit.*

Example 5. *If one is consuming a refreshing malt beverage at a rate of* $8t - t^2$ *cubic centimeters per second, coming from a can with width* 5 *centimeters, how fast the level of liquid dropping after three seconds?*

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Example 7. *The revenue from Pet Rocks was*

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where revenue is measured in millions of dollars and time is measured in weeks after June 5, 1967. When is the revenue at its maximum?

Example 7. *The revenue from Pet Rocks was*

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where revenue is measured in millions of dollars and time is measured in weeks after June 5, 1967. When is the revenue at its maximum? What is that maximum?