

1. **SHOW ALL work/reasoning:** Determine the limit, if it exists:  $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{x}\right)^{\frac{1}{x}}$

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2. **SHOW ALL work/reasoning:** Compute the definite integral:  $\int_2^6 (4 - 3x + 2x^3) dx$

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3. **SHOW ALL work/reasoning:** Determine the limit, if it exists:  $\lim_{x \rightarrow \infty} \frac{\log(4x)}{x}$

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4. **SHOW ALL work/reasoning:** Analyse the 1st& 2nd derivatives to sketch the graph of:  $f(x) = 2x^3 - 6x^2$

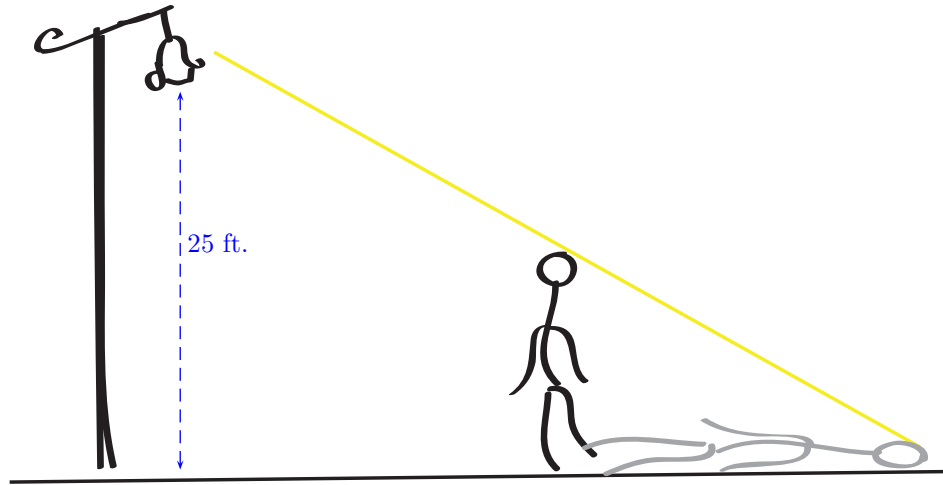
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5. **SHOW ALL work/reasoning:** Compute the definite integral:  $\int \sec(x) \tan(x) dx$

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6. **SHOW ALL work/reasoning:**

Consider a 6ft-tall man walking by a street lamp, 25 ft high. How fast is the tip of his shadow moving as he walks away from the lamp at a rate of  $3\text{ft/sec}$ ?"



7. **SHOW ALL work/reasoning:**

Consider the inscribed cylinder: What is the largest possible volume of the cylinder if the radius of the sphere is restricted to  $20\text{ cm}$

