

<b>Name:</b>
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- 1) A cylindrical can is to be made to hold  $16\pi \text{ cm}^3$  of laban. Let  $r$  be the radius and  $h$  be the height of the can. Determine  $r$  and  $h$  which minimize the cost of the metal to manufacture the can.
- 2) Compute  $\lim_{x \rightarrow \infty} (xe^{1/x} - x)$ .
- 3) The curve  $y = f(x)$  passes through the point  $(1, 4)$ , and its slope at the point  $(x, f(x))$  is given by the formula  $\frac{1}{x^2}$ . Determine the function  $f$ .
- 4) Starting with  $x_1 = 1$ , approximate the root of  $x^4 - 6x + 3 = 0$ , correct to one decimal place.
- 5) Determine the increasing and the decreasing intervals of the function  $f(x) = x^2(2x - 5)^{1/3}$ .