

Your Name:

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1. A snowball melts so that its surface area decreases at a rate of  $40\pi$  cm<sup>2</sup>/min. Find the rate of change of the snowball's diameter when the diameter is 20 cm. (Hint:  $S = 4\pi r^2$ .)

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2. An airplane flying at an altitude of 10 miles passes directly over a radar antenna. When the airplane is 26 miles away from the antenna, the radar detects that the distance between the antenna and the airplane is changing at a rate of 480 mph. What is the horizontal speed of the airplane?
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3. Find the absolute maximum and minimum of the function  $f(x) = x^2 + 2x - 3$  on the interval  $[-1, 1]$ .

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4. Find the absolute maximum of the function  $f(x) = x^4 - 8x^2 + 1$  on the interval  $-1 \leq x \leq 3$ .
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5. Sketch the graph of  $f(x) = x^3 + 6x^2 - 15x$

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6. Sketch the graph of  $g(x) = \frac{x^2}{x-1}$ .

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