Review of Sections 4.4 and 4.7

1. Find the limit.

(a)
$$\lim_{x \to \infty} \frac{(\ln x)^2}{x - 1}$$

(b) $\lim_{x \to 0} \frac{\sin x - x}{x^3}$

(c)
$$\lim_{x \to 1} \left(\frac{1}{\ln x} - \frac{1}{x - 1} \right)$$

(d)
$$\lim_{x \to 0^+} x^2 \ln x$$

(e)
$$\lim_{x \to \infty} \sqrt{x}e^{-x/2}$$

(f)
$$\lim_{x \to 0} (\sin x)^{\tan x}$$

(g)
$$\lim_{x \to \infty} \left(\frac{2x-3}{2x+5}\right)^{2x+1}$$

(h)
$$\lim_{x \to 0^+} (1 + \sin 3x)^{1/x}$$

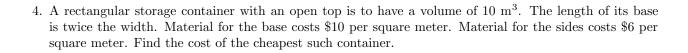


2. A farmer with 750 ft of fencing wants to enclosed a rectangular field and then divide it in four parts with a fence parallel to one of the sides of the rectangle. What is the largest possible total area of the four

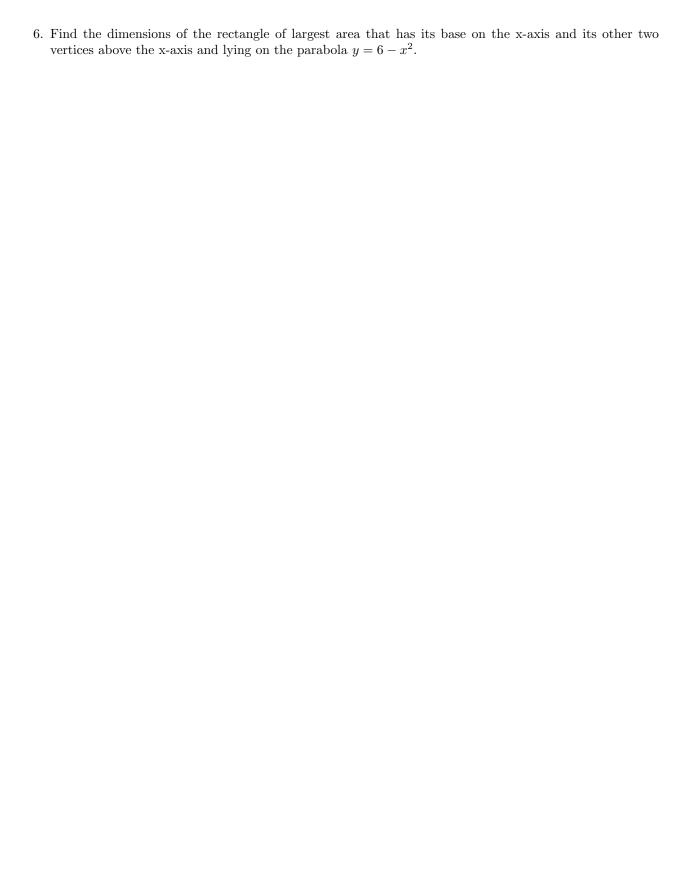
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3. A box with a square base and open top must have a volume of $32000~\mathrm{cm}^3$. Find the dimensions of the

box that minimize the amount of material used.







7. Find the point on the line 6x + y = 5 that are closest to the point (-5,3).

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8. Find the dimensions of the rectangle of largest area that can be inscribed in an equilateral triangle of side

L if one side of the rectangle lies on the base of a triangle.