10 Area $= \int_{-\infty}^{0} \frac{8}{x-4}\,dx$

$$= 8 \int_{-\infty}^{0} \frac{1}{x-4}\,dx$$

$$= 8 \lim_{b \to -\infty} \int_{b}^{0} \frac{1}{x-4}\,dx$$

$$= 8 \lim_{b \to -\infty} \ln|x-4| \Big|_{b}^{0}$$

$$= 8 \lim_{b \to -\infty} \left[\ln|-4| - \ln|b-4| \right]$$

$$= 8 \lim_{b \to -\infty} \left[\ln 4 - \ln|b-4| \right] \qquad \text{As } b \to -\infty \ \ln|b-4| \to \infty$$

= diverges

11 Labor (x) — \$256 / unit

Materials (y) — \$122 / unit

Capital (z) — \$84 / unit

Total cost $= 256x + 122y + 84z$

12 $f(x,y) = \sqrt{y^2 + 4x^2}$

$f(2,-3) = \sqrt{(-3)^2 + 4(2)^2} = \sqrt{9+16} = \sqrt{25} = 5$

$f(-5,-5) = \sqrt{(-5)^2 + 4(-5)^2} = \sqrt{25+100} = \sqrt{125} = 5\sqrt{5}$

$f(0,6) = \sqrt{6^2 + 4 \cdot 0^2} = \sqrt{36} = 6$