Find Relative Extrema

$$f(x)=(x+1)^2(x-2)$$

Relative Extrema

$$f'(x)=0$$

$$f(x)=(x^2+2x+1)(x-2)$$

$$=x^3-2x^2+2x^2-4x+x-2$$

$$f(x)=x^3-3x-2$$

$$f'(x)=3x^2-3=0$$

$$3x^2=3$$

$$x^2=1$$

$$x=\pm 1$$

$$f''(x)=6x$$

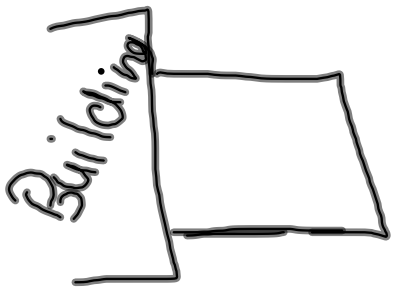
$$f''(1)=6$$

$$f''(-1)=-6$$

min @ $x=1$

max @ $x=-1$

1600 ft



$A = l \cdot w$

$P = 2w + l = 1600$

$l = 1600 - 2w$

$A = (1600 - 2w)w$

$A = 1600w - 2w^2$

$\frac{dA}{dw} = 1600 - 4w = 0$

$-1600 = -4w$

$w = 400$

$l = 1600 - 2(400) =$

$l = 1600 - 800 = 800$

$A = (800)(400) =$

$A = 320000 \text{ ft}^2$

	f(x)	f'(x)	f''(x)
pos	fx > 0 above x axis	increasing (pos slope)	concave up → min
0	on x-axis	min/max	inflection point
neg	below x-axis	decreasing (neg slope)	concave down → max

$$\int 5\sqrt{x^2}\,dx$$

$$\int x^{2/5}\,dx$$

$$\frac{x^{7/5}}{7/5} = \frac{5x^{7/5}}{7} + C$$

$$\int_0^1 2x\,dx = \frac{2x^2}{2}\Big|_0^1 = x^2\Big|_0^1$$

$$1 - 0 = 1$$

$$\int_2^7 3\,dx = 3x\Big|_2^7 = 21 - 6 =$$

$$\int_{-1}^{0} (x-2)\,dx = \frac{x^2}{2} - 2x\Big|_{-1}^{0}$$

$$0 - \left(\frac{1}{2} + 2\right)$$

$$-5/2$$

$$\int_1^4 \frac{u-2}{\sqrt{u}}\,du$$

$$\int_1^4 \frac{u^1}{u^{1/2}} - \frac{2}{u^{1/2}}\,du$$

$$\int_1^4 \left(u^{1/2} - 2u^{-1/2}\right)du$$

$$\frac{2u^{3/2}}{2} - 4u^{1/2}\Big|_1^4$$

$$f(c) = \frac{1}{(b-a)} \int_a^b f(x)\,dx$$

$$f(x) = \cos x \qquad [2\pi, 3\pi]$$

$$f(c) = \frac{1}{3\pi - 2\pi} \int_{2\pi}^{3\pi} \cos x\,dx$$

$$f(c) = \frac{1}{\pi}\left(-\sin x \Big|_{2\pi}^{3\pi}\right)$$

$$f(c) = \frac{1}{\pi}\left(-\sin(3\pi) + \sin(2\pi)\right)$$

$$0 \qquad 0$$

$$f(c) = 0$$

$$\sum_{i=1}^{10} (i^2 - 2i + 3)$$

$$= \frac{n(n+1)(2n+1)}{6} - 2\left(\frac{(n+1)n}{2}\right) + 3n$$

$$= \frac{(10)(11)(21)}{6} - \frac{2(11)(10)}{2} + 30$$

$$= 305$$

$$f(x) = 3x^2 + 2 \quad [2, 5]$$

$$\omega = \frac{3}{n} \qquad x_i = \frac{3i}{n} + 2$$

$$\lim_{n \to \infty} \sum_{i=1}^{n} \omega \, f(x_i)$$

$$\lim_{n \to \infty} \sum_{i=1}^{n} \frac{3}{n} \left(3\left(\frac{3i}{n} + 2 \right)^2 + 2 \right)$$

$$\lim_{n \to \infty} \sum_{i=1}^{n}$$