

C

9.  $f'(x) = \frac{1}{2}(3x-1)^{-1/2}$

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$$f'(x) = \frac{1}{2\sqrt{3x-1}}$$

when  $f'(x) = 2$

$$2 = \frac{1}{2\sqrt{3x-1}}$$

$$(4\sqrt{3x-1})^2 = (1)^2$$

$$16(3x-1) = 1$$

$$48x - 16 = 1$$

$$48x = 17$$

$$x = \frac{17}{48}$$

$$y = \frac{1}{4}$$

10.  $y = 2\sin x$

$$y' = 2\cos x$$

when  $y' = 2$

$$2 = 2\cos x$$

$$1 = \cos x$$

$$x = 0, 2\pi$$

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a)  $f'(x) = 8x + 12$   
 $0 = 8x + 12$   
 $-12 = 8x$   
 $\boxed{-\frac{3}{2} = x}$

$f(-2) = -15$   
 $f(1) = 9 \leftarrow \text{Absolute max}$   
 $f(-\frac{3}{2}) = -16 \leftarrow \text{Absolute min}$

b)  $g'(x) = 3x^2 - 27$   
 $0 = 3x^2 - 27$   
 $27 = 3x^2$   
 $9 = x^2$   
 $\boxed{\pm 3 = x}$

$f(-3) = 86 \leftarrow \text{Absolute max}$   
 $f(3) = -22 \leftarrow \text{Absolute min}$   
 $f(-4) = 76$   
 $f(4) = -12$

c)  $y' = \frac{1(1-x) - (-1)(1+x)}{(1-x)^2}$

$f(2) = -3 \leftarrow \text{Absolute min}$   
 $f(5) = -1.5 \leftarrow \text{Absolute max}$

$y' = \frac{1-x+1+x}{(1-x)^2}$

~~$f(4) =$~~

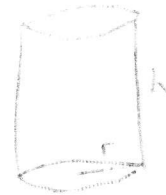
$0 = \frac{2}{(1-x)^2}$

No critical #'s

C

12.

(24)



$$Cost = \pi r^2 + 2\pi r h$$

$$V = 4000$$

$$Cost = \pi r^2 + 2\pi r \left( \frac{4000}{\pi r^2} \right)$$

$$\pi r^2 h = 4000$$

$$h = \frac{4000}{\pi r^2}$$

$$Cost = \pi r^2 + \frac{8000}{r}$$

$$Cost' = 2\pi r - \frac{8000}{r^2}$$

$$0 = 2\pi r - \frac{8000}{r^2}$$

$$\frac{8000}{r^2} = 2\pi r$$

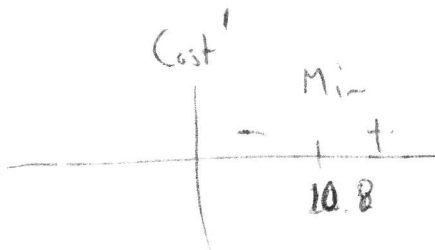
$$8000 = 2\pi r^3$$

$$12566.4 = r^3$$

$$1273.2 = r^3$$

$$10.8 = r$$

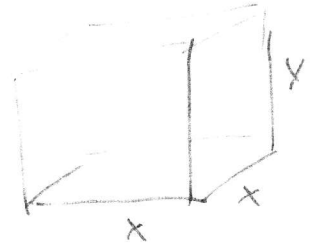
Dimensions  
 10.8cm  
~~23.2cm~~ radius  
 10.8cm  
~~7.4cm~~ height



C

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13.



$$V = x^2 y$$

$$V = x^2 \left( \frac{4000 - x^2}{4x} \right)$$

$$V = 1000x - \frac{x^3}{4}$$

$$V' = 1000 - \frac{3x^2}{4}$$

$$0 = 1000 - \frac{3x^2}{4}$$

$$\frac{3x^2}{4} = 1000$$

$$3x^2 = 4000$$

$$x^2 = \frac{4000}{3}$$

$$x = \pm 36.5$$

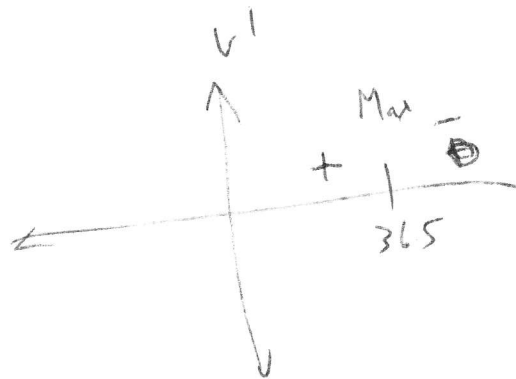
↑  
inadmissibel

$$S.A. = 4000$$

$$x^2 + 4xy = 4000$$

$$y = \frac{4000 - x^2}{4x}$$

~~40~~



Dimensionen

$$x = 36.5 \text{ cm}$$

$$y = 18.3 \text{ cm}$$