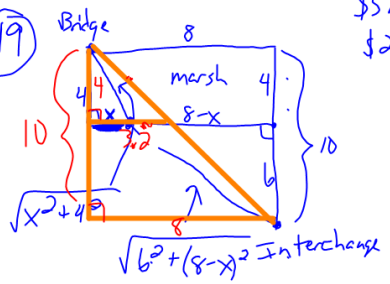
(19)



$5 million/mile - marsh
$2 million/mile - dry

$[0, 8]$

1.25 miles east of the bridge

$\frac{10}{8} = \frac{4}{x}$

$x = 3.2$

$C(0) = \$40$ million
$C(8) = \$56.7$ million
$C(1.25) = \$39.02$ million

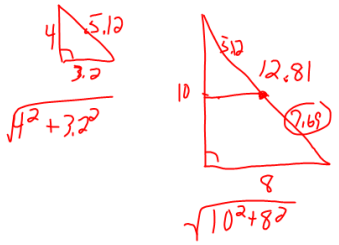
$C(x) = 5(x^2+16)^{1/2} + 2(x^2-16x+100)^{1/2}$

$C'(x) = \frac{5}{2}(x^2+16)^{-1/2}(2x) + (x^2-16x+100)^{-1/2}(2x-16)$

$C'(x) = 5x(x^2+16)^{-1/2} + (2x-16)(x^2-16x+100)^{-1/2}$

$C'(x) = \frac{5x}{\sqrt{x^2+16}} + \frac{2x-16}{\sqrt{x^2-16x+100}} \Rightarrow$ crit # $x = 1.25$

40.96
−35.02
$1.94 million



$C(x) = 5(5.12) + 2(7.68)$
$= \$40.96$ million

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(20) $C(x) = 6(x^2+16)^{1/2} + 2(x^2-16x+100)^{1/2}$

$C'(x) = 3\cdot(x^2+16)^{-1/2}(2x) +$ same

$= \frac{6x}{\sqrt{x^2+16}} +$ same $\Rightarrow$ crit # 1.04

$[0,8]$

$C(0) = \$44$ million
$C(8) = \$65.67$ million
$C(1.04) = \$43.18$ million
$C(1.25) = \$43.21$ million

1.04 miles east of the bridge

(25) $V = 12$ fl. oz.

$1 \text{ fl. oz} = 1.804696 \text{ in}^3$

$V = 21.65628 \text{ in}^3$

$21.65628 = \pi r^2 h$

$\frac{21.65628}{\pi r^2} = h$

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

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

$C(r) = 4\pi r^2 + 2\pi r \left(\frac{21.65628}{\pi r^2}\right)$

$C(r) = 4\pi r^2 + 43.31256 r^{-1}$

$C'(r) = 8\pi r - 43.31256 r^{-2}$

$C'(r) = \frac{8\pi r^3 - 43.31256}{r^2}$

$C'(r)$: $-$ | 0 | $+$ (min at 1.1989)

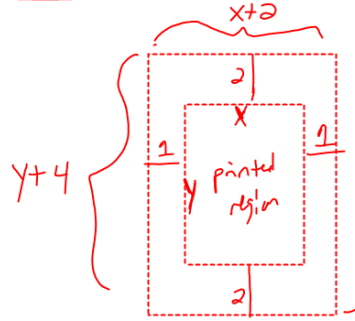
$0 = 8\pi r^3 - 43.31256$

$\sqrt[3]{\frac{43.31256}{8\pi}} = r$

$1.1989 = r$

radius ≈ 1.1989 in

height ≈ 4.7959 in



Printed Area $= 92 \text{ in}^2 = xy$

$\frac{92}{x} = y$

Total $= (x+2)(y+4)$

$T(x) = (x+2)\left(\frac{92}{x} + 4\right)$

$T'(x) = \left(\frac{92}{x} + 4\right) + (x+2)(-92x^{-2})$

$T'(x)$