

; (") x - .
 ; x
 , x+12 -
 (t) (v) (s) - s = vt

" s	" v	t		
120	x	$\frac{120}{x}$	B - A -	,
60	x	$\frac{60}{x}$,
-	-	$\frac{10}{60}$		
60	x+12	$\frac{60}{x+12}$		

$$\frac{120}{x} = \frac{60}{x} + \frac{10}{60} + \frac{60}{x+12} :$$

$$\frac{120}{x} = \frac{60}{x} + \frac{1}{6} + \frac{60}{x+12} \quad / 6x(x+12)$$

$$720(x+12) = 360(x+12) + x(x+12) + 360x$$

$$720x + 8640 = 360x + 4320 + x^2 + 12x + 360x$$

$$0 = x^2 + 12x - 4320$$

$$x_{1,2} = \frac{-12 \pm 132}{2}$$

$$\boxed{x = 60} \quad \leftarrow x > 0$$

. " 60 ' :

$$\frac{120}{60} = 2 :$$

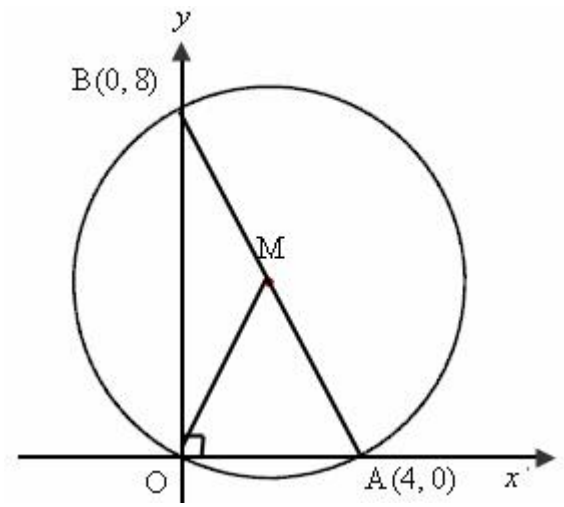
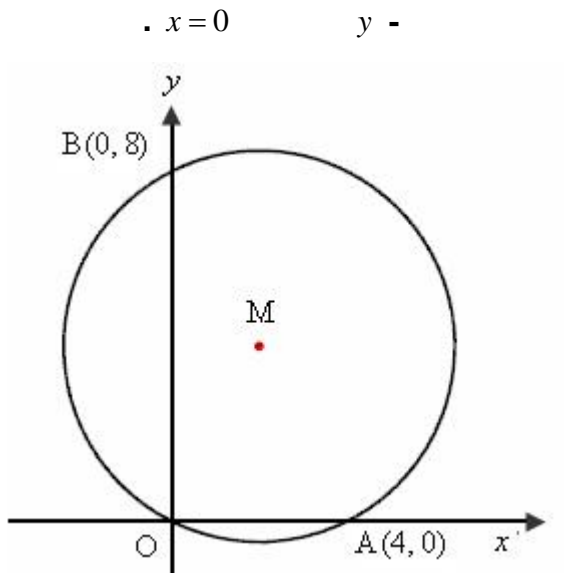
10⁰⁰

08⁰⁰ -

.10⁰⁰

:

"



$x=0$ $y=0$

$x=0$ $y=0$

$x=0$ $y=0$

$$\begin{aligned} (x-2)^2 + (0-4)^2 &= 20 \\ (x-2)(x-2) + 16 &= 20 \\ x^2 - 2x - 2x + 4 + 16 - 20 &= 0 \\ x^2 - 4x &= 0 \\ x(x-4) &= 0 \\ x=0, 4 &\rightarrow \boxed{A(4,0)} \end{aligned}$$

$$\begin{aligned} (0-2)^2 + (y-4)^2 &= 20 \\ 4 + (y-4)(y-4) &= 20 \\ 4 + y^2 - 4y - 4y + 16 - 20 &= 0 \\ y^2 - 8y &= 0 \\ y(y-8) &= 0 \\ y=0, 8 &\rightarrow \boxed{B(0,8)} \end{aligned}$$

$B(0,8)$, $A(4,0)$:

AB

$$\begin{aligned} m_{AB} &= \frac{8-0}{0-4} = \frac{8}{-4} = -2 \\ y-0 &= -2(x-4) \\ \boxed{y} &= \boxed{-2x+8} \end{aligned}$$

$y = -2x + 8$ AB

AB

$\angle BOA = 90^\circ$

$\triangle ABO$

OM

M

$\triangle BMO$

2

$\triangle ABO$

$$(x \neq 0) \quad f(x) = \frac{7}{x} + \frac{x}{7}$$

$$f'(x) = -\frac{7}{x^2} + \frac{1}{7}$$

$$0 = -\frac{7}{x^2} + \frac{1}{7} \quad / \cdot 7x^2$$

$$0 = -49 + x^2$$

$$49 = x^2 \quad \rightarrow x = \pm 7$$

$$x = 7 \quad \rightarrow y = \frac{7}{7} + \frac{7}{7} = 2 \quad \rightarrow (7, 2)$$

$$x = -7 \quad \rightarrow y = \frac{7}{-7} + \frac{-7}{7} = -2 \quad \rightarrow (-7, -2)$$

$$f'(-8) = -\frac{7}{(-8)^2} + \frac{1}{7} = 0.03 > 0, \quad f'(-6) = -\frac{7}{(-6)^2} + \frac{1}{7} = -0.05 < 0$$

$$f'(6) = -\frac{7}{6^2} + \frac{1}{7} = -0.05 < 0, \quad f'(8) = -\frac{7}{8^2} + \frac{1}{7} = 0.03 > 0$$

-8	-7	-6	0	6	7	8	x
+	0	-		-	0	+	y'
↘	Max	↙		↘	Min	↗	

$(-7, -2)$, $(7, 2)$:

$$(x \neq 0) \quad g(x) = \frac{7}{x} - \frac{x}{7}$$

$$g'(x) = -\frac{7}{x^2} - \frac{1}{7}$$

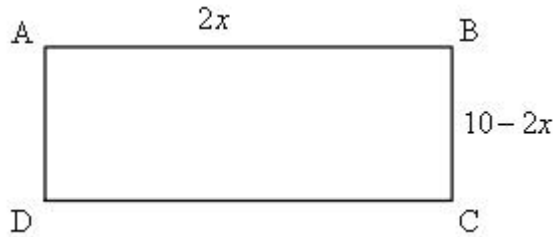
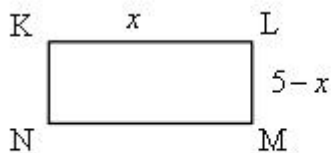
$$g'(x) = -\frac{7}{x^2} - \frac{1}{7}$$

$$x > 0 \quad x < 0$$

$$0 = -\frac{7}{x^2} - \frac{1}{7}$$

$$0 = -49 - x^2$$

$$x^2 = -49$$



, KLMN

" 10 KLMN

$$2 \cdot x + 2 \cdot LM = 10$$

$$2LM = 10 - 2x$$

$$LM = \frac{10 - 2x}{2}$$

$$LM = 5 - x$$

2 ABCD

, " 20 ABCD

$$AB = 2 \cdot KL = 2x$$

$$2 \cdot 2x + 2 \cdot BC = 20$$

$$2BC = 20 - 4x$$

$$BC = \frac{20 - 4x}{2}$$

$$BC = 10 - 2x$$

$x, 5-x$: ABCD :

$2x, 10-2x$: KLMN

מקסימום סכום שטחי שני האלפנים

$$f(x) = x(5-x) + 2x(10-2x)$$

$$f(x) = 5x - x^2 + 20x - 4x^2$$

$$f(x) = -5x^2 + 25x$$

:

$$f'(x) = -10x + 25$$

$$0 = -10x + 25$$

$$10x = 25 \quad /:10$$

$$x = 2.5$$

$$f'(2) = -10 \cdot 2 + 25 > 0, \quad f'(3) = -10 \cdot 3 + 30 < 0$$

0	2	2.5	3	x
	+	0	-	$f'(x)$
	↗	Max	↘	

$$x = 2.5$$

$x = 2.5$:

$$f'(x) = 2x(x^2 - 6x + 8) \quad f(x)$$

$$0 = 2x(x^2 - 6x + 8)$$

$$2x = 0 \rightarrow \boxed{x=0}$$

$$x^2 - 6x + 8 = 0$$

$$x_{1,2} = \frac{6 \pm 2}{2}$$

$$x_1 = \frac{6+2}{2} = \frac{8}{2} = 4 \rightarrow \boxed{x=4}$$

$$x_2 = \frac{6-2}{2} = \frac{4}{2} = 2 \rightarrow \boxed{x=2}$$

$$f'(x) = 2x^3 - 12x^2 + 16x$$

$$\boxed{f''(x) = 6x^2 - 24x + 16}$$

$$f''(0) = 6 \cdot 0^2 - 24 \cdot 0 + 16 = 16 > 0 \rightarrow \text{min}$$

$$f''(2) = 6 \cdot 2^2 - 24 \cdot 2 + 16 = -8 < 0 \rightarrow \text{max}$$

$$f''(4) = 6 \cdot 4^2 - 24 \cdot 4 + 16 = 16 > 0 \rightarrow \text{min}$$

$$x = 4, \quad x = 2, \quad x = 0 :$$

$$: f(x), \quad f'(x)$$

$$f(x) = \int f'(x) dx$$

$$f(x) = \int (2x^3 - 12x^2 + 16x) dx$$

$$f(x) = \frac{2x^4}{4} - \frac{12x^3}{3} + \frac{16x^2}{2} + c$$

$$f(x) = \frac{x^4}{2} - 4x^3 + 8x^2 + c$$

.4

y -

:

(2,4)

$$4 = \frac{2^4}{2} - 4 \cdot 2^3 + 8 \cdot 2^2 + c$$

$$4 = 8 + c$$

$$c = -4$$

$$\boxed{f(x) = \frac{x^4}{2} - 4x^3 + 8x^2 - 4}$$

"

$$f(x) = \frac{x^4}{2} - 4x^3 + 8x^2 - 4 :$$

$$x = 1.5 \quad , A \quad f(x) = -x^2 + ax - 3 \quad 1 \quad .$$

$$, f'(1.5) = 1 ,$$

$$f'(x) = -2x + a$$

$$1 = -2 \cdot 1.5 + a$$

$$1 = -3 + a$$

$$\boxed{a = 4}$$

$$. a = 4 :$$

$$\boxed{f(x) = -x^2 + 4x - 3} : \quad a = 4 \quad .$$

:

$$x_A = 1.5 \rightarrow y = -1.5^2 + 4 \cdot 1.5 - 3 = 0.75$$

$$A(1,5, 0.75), \quad m = 1$$

$$y - 0.75 = 1(x - 1.5)$$

$$y - 0.75 = x - 1.5$$

$$\boxed{y = x - 0.75}$$

$$. y = x - 0.75 :$$

$$. m = -1 \quad , \quad .$$

:

$$A(1,5, 0.75), \quad m = -1$$

$$y - 0.75 = -1(x - 1.5)$$

$$y - 0.75 = -x + 1.5$$

$$\boxed{y = -x + 2.25}$$

$$y = -x + 2.25 :$$