

כספר של 700 - A - נ (km) X מחזור
 מחזור יחס של 800 - C - נ (km) X + 20

$$t_1 = \frac{240}{x}$$

$$t_2 = \frac{150}{20+x}$$

$$t_1 - t_2 > 1\frac{1}{2}$$

הפס
 שנייה
 של 1.5
 כיצד
 מחזור
 של 800

$$-1\frac{1}{2} > 0 \quad | \cdot x(20+x)$$

$$\frac{240}{x} - \frac{150}{x+20} > 1\frac{1}{2} \quad | \cdot x(x+20)$$

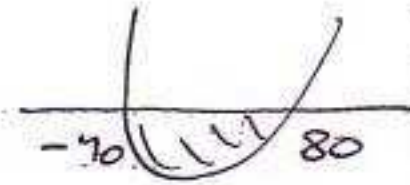
$$240(x+20) - 150x - 1\frac{1}{2}x(x+20) > 0$$

$$240x + 4800 - 150x - 1\frac{1}{2}x^2 - 30x > 0$$

$$-1\frac{1}{2}x^2 + 60x + 4800 > 0 \quad | \cdot -1\frac{1}{2}$$

$$x^2 - 40x - 3200 < 0$$

$$x_{1,2} = \frac{40 \pm 120}{2} \Rightarrow \begin{cases} x_1 = 80 \\ x_2 = -40 \end{cases}$$



$$-40 < x < 80$$

$$\begin{matrix} \text{p.d} \\ 0 < x \end{matrix} \Rightarrow$$

$$\boxed{0 < x < 80} \quad | \cdot \bar{t}$$

$$t_2 = \frac{150}{x+20} = \frac{150}{80+20} = \frac{150}{100} = 1.5$$

$$x = 80$$

$$S = x \cdot t_1 = 80 \cdot 2.5 = \boxed{200}$$

200
 2.5
 A - N

000

$$a_n = 6^n + (-1)^{n+1}$$

2

$$\frac{a_k}{7} = I = \frac{6^k + (-1)^{k+1}}{7}$$

נכנס (נוח שיהיה) (כיוון שקנה $n=k$)

$$\frac{a_1}{7} = \frac{6^1 + (-1)^{1+1}}{7} = \frac{6+1}{7} = \frac{7}{7} = 1 \checkmark$$

$n=1$ נכנס

$$a_{k+1} = 6^{k+1} + (-1)^{k+1+1}$$

$n=k$ נכנס

$$= 6 \cdot 6^k + (-1) \cdot (-1)^{k+1}$$

שלם

$$\frac{a_{k+1}}{7} = \frac{6 \cdot 6^k - (-1)^{k+1}}{7} = \frac{6 \left[\frac{6^k + (-1)^{k+1}}{7} \right] - \frac{7 \cdot (-1)^{k+1}}{7}}{7}$$

$$= 6I - (-1)^{k+1} = 6I + (-1)^k = \text{שלם}$$

שלם

$$|x+1| + |x| < 4$$

2

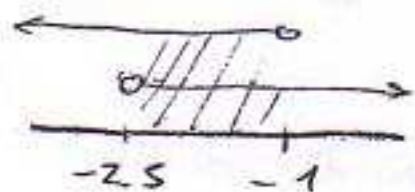
$$x < -1$$

$$-(x+1) - x < 4$$

$$-2x - 1 < 4$$

$$-2x < 5 \quad | : -2$$

$$x > -2.5$$



$$-2.5 < x < -1$$

$$-1 \leq x < 0$$

$$x+1 - x < 4$$

$$1 < 4$$

אין פתרון

$$-1 \leq x < 0$$



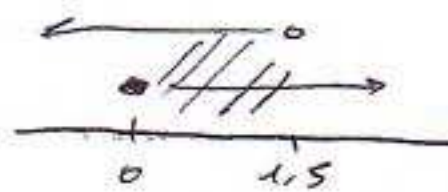
$$-2.5 < x < -1$$

$$x \geq 0$$

$$x+1+x < 4$$

$$2x < 3$$

$$x < 1.5$$



$$0 \leq x < 1.5$$

$$\boxed{-2.5 < x < 1.5}$$

פתרון

006/3) $f(x) = \cos^2 x - a^2 \cos x$ $0 \leq x \leq 2\pi$ $a > \sqrt{2}$
 $0 \leq x \leq 360^\circ$

$0 = \cos^2 x - a^2 \cos x$

$\gamma = 0$: x נקודות קיצון.

$0 = \cos x (\cos x - a^2) = 0$

$\cos x = 0$

$\cos x = a^2 > 2$

I) $x = 90^\circ + 360^\circ k$

\Downarrow

II) $x = -90^\circ + 360^\circ k$

\emptyset

$-1 \leq \cos x \leq 1$

אפשר $x = 90^\circ, 270^\circ$

$= \frac{\pi}{2}, \frac{3\pi}{2}$

$\Rightarrow \left[\left(\frac{\pi}{2}, 0 \right) \left(\frac{3\pi}{2}, 0 \right) \right]_{\text{קיצ}}$

$f'(x) = -2 \sin x \cos x + a^2 \sin x = 0$

$\sin x (a^2 - 2 \cos x) = 0$

$\sin x = 0$

$\cos x = \frac{a^2}{2} > 1$

I) $x = 0 + 360^\circ k$

\Downarrow

II) $x = 180^\circ + 360^\circ k$

\emptyset

$-1 \leq \cos x \leq 1$

אפשר $x = 0, 180^\circ, 360^\circ$

$= 0, \pi, 2\pi$

$\rightarrow \begin{matrix} \text{min} & \text{max} & \text{min} \\ (0, 1-a^2) & (\pi, 1+a^2) & (2\pi, 1-a^2) \end{matrix}$

$f'(x) = -2 \sin x \cos x + a^2 \sin x$

$f'(\frac{\pi}{2}) = -2 \sin 90^\circ \cos 90^\circ + a^2 \sin 90^\circ = +a^2$

$f'(\frac{3\pi}{2}) = -2 \sin 270^\circ \cos 270^\circ + a^2 \sin 270^\circ = -a^2$

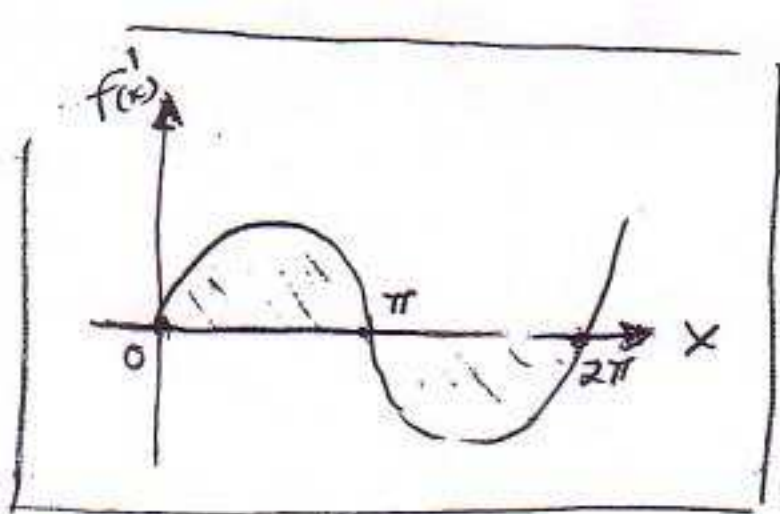
x	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
f'	0	$+$	0	$-$	0
	min	\nearrow	max	\searrow	min

$f(0) = \cos^2(0) - a^2 \cos(0) = 1 - a^2$

$f(\pi) = \cos^2(\pi) - a^2 \cos(\pi) = (-1)^2 - a^2 \cdot (-1) = 1 + a^2$

$f(2\pi) = \cos^2(360^\circ) - a^2 \cos(360^\circ) = 1 - a^2$

$0 < x < \pi$: נקודות קיצון $f'(x)$	$(0, 1-a^2) (2\pi, 1-a^2)$: נקודות מינימום
$\pi < x < 2\pi$: נקודות קיצון $f'(x)$	$(\pi, 1+a^2)$: נקודת מקסימום



$$f'(0) = f'(\pi) = f'(2\pi) = 0$$

0.7

$$S = 16 = \int_0^{\pi} f(x) dx + \left| \int_{\pi}^{2\pi} f(x) dx \right| = f(x) \Big|_0^{\pi} + \left| f(x) \Big|_{\pi}^{2\pi} \right|$$

$$= (\cos^2 x - a^2 \cos x) \Big|_0^{\pi} + \left| (\cos^2 x - a^2 \cos x) \Big|_{\pi}^{2\pi} \right|$$

$$= (\cos^2 \pi - a^2 \cos \pi) - (\cos^2 0 - a^2 \cos 0)$$

$$+ \left| (\cos^2 2\pi - a^2 \cos 2\pi) - (\cos^2 \pi - a^2 \cos \pi) \right| =$$

$$= (1 - a^2 \cdot (-1)) - (1 - a^2 \cdot 1)$$

$$+ \left| (1 - a^2 \cdot 1) - ((-1)^2 - a^2 \cdot (-1)) \right| =$$

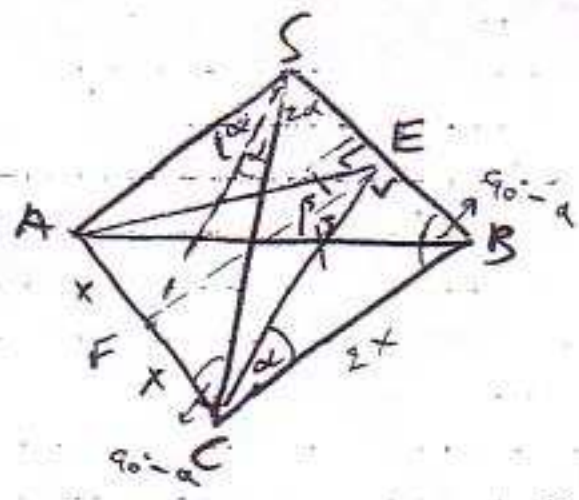
$$= 1 + a^2 - 1 + a^2 + \left| 1 - a^2 - (1 + a^2) \right| =$$

$$= 2a^2 + \left| 1 - a^2 - 1 - a^2 \right| = 2a^2 + \left| -2a^2 \right| =$$

$$= 2a^2 + 2a^2 = 4a^2 = S = 16$$

$$\Rightarrow a^2 = 4 \sqrt{\quad} \Rightarrow \boxed{a = 2}$$

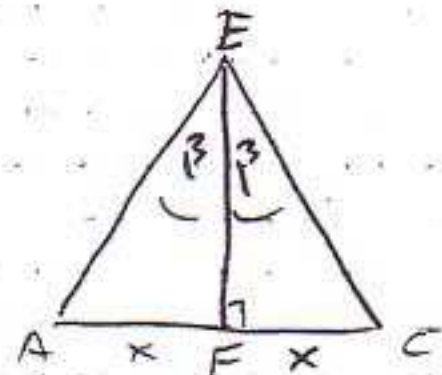
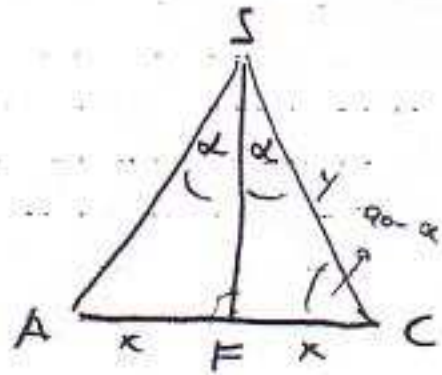
1.2



$$\angle ASB = \angle ASC = \angle BSC = 2\alpha$$

$$\angle AEC = 2\beta$$

$$AC = 2x \quad (10)$$

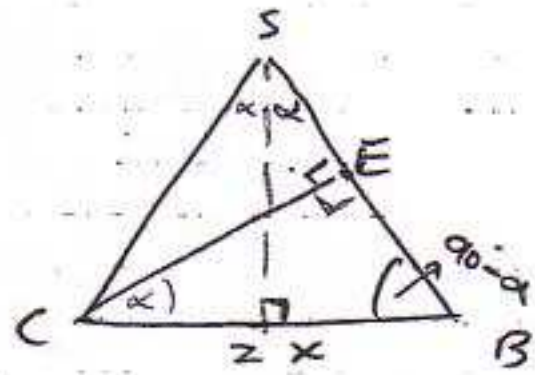


$$\triangle ACE: \sin \beta = \frac{x}{CE}$$

$$\triangle SBC: \cos \alpha = \frac{CE}{2x}$$

$$\Rightarrow CE = 2x \cos \alpha$$

$$\Rightarrow \sin \beta = \frac{x}{2x \cos \alpha} = \frac{1}{2 \cos \alpha} = \sin \beta \quad | \quad \bar{E}$$



$$\text{Area } P_{ABC} = 3 \cdot (2x) = 6x$$

$$\triangle ASC: \frac{x}{SC} = \sin \alpha \Rightarrow SC = \frac{x}{\sin \alpha}$$

$$\text{Area } P_{SAC} = 2 \cdot SC + AC = \frac{2x}{\sin \alpha} + 2x$$

$$| \cup | \quad P_{SAC} = P_{ABC} \Rightarrow \frac{2x}{\sin \alpha} + 2x = 6x \quad | : x$$

$$\frac{2}{\sin \alpha} + 2 = 6$$

$$2 = 4 \sin \alpha \quad | : 4$$

$$\frac{2}{\sin \alpha} = 4 \Rightarrow$$

$$\sin \alpha = \frac{1}{2} \Rightarrow \alpha = 30^\circ$$

$$\Rightarrow \cos \alpha = \cos 30^\circ = \frac{\sqrt{3}}{2}$$

$$\sin \beta = \frac{1}{2 \cos \alpha} = \frac{1}{2 \cdot \frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} \Rightarrow \beta = 35.26^\circ \quad | \quad \bar{E}$$

$$f'(x) = 2x \quad f'(t) = 2t = m \quad (t, t^2)$$

$$y - t^2 = 2t(x - t)$$

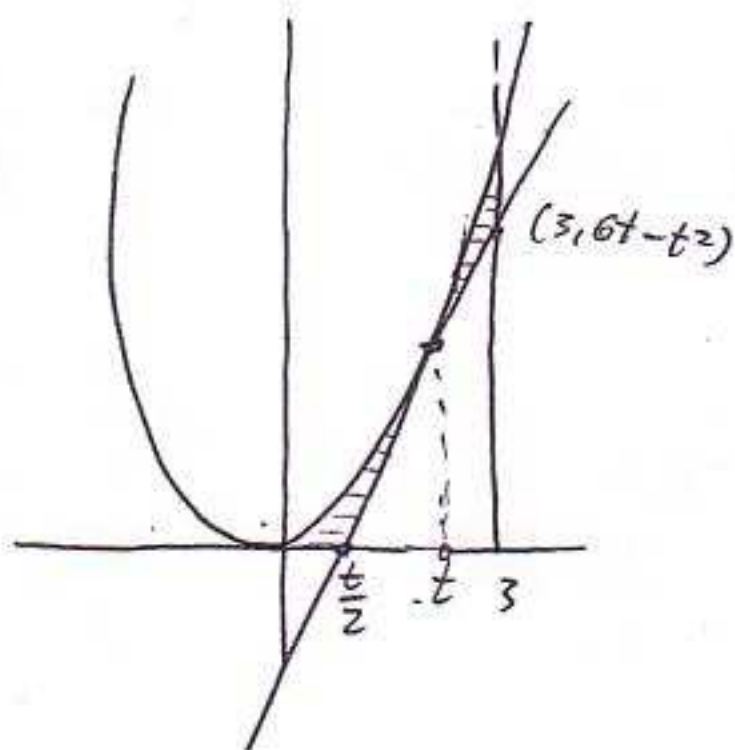
$$y - t^2 = 2tx - 2t^2 \Rightarrow y = 2tx - t^2$$

∴ p'21

$$0 = 2tx - t^2$$

$$t^2 = 2tx \quad | :t$$

$$t = 2x \Rightarrow x = \frac{t}{2}$$



$$S = \int_0^3 x^2 dx - \int_{\frac{t}{2}}^3 (2tx - t^2) dx$$

$$= \left. \frac{x^3}{3} \right|_0^3 - \left[t \cdot \frac{x^2}{2} - t^2 x \right]_{\frac{t}{2}}^3 =$$

$$= \left(\frac{3^3}{3} - 0 \right) - \left[(t \cdot 3^2 - t^2 \cdot 3) - \left(t \cdot \left(\frac{t}{2}\right)^2 - t^2 \cdot \frac{t}{2} \right) \right] =$$

$$= 9 - \left[9t - 3t^2 - \left(\frac{t^3}{4} - \frac{t^3}{2} \right) \right] = 9 - \left[9t - 3t^2 - \left(-\frac{t^3}{4} \right) \right]$$

$$S(t) = -\frac{t^3}{4} + 3t^2 - 9t + 9$$

$$S'(t) = -\frac{3t^2}{4} + 6t - 9 = 0 \quad | \cdot 4 \Rightarrow -3t^2 + 24t - 36 = 0$$

$$t_{1,2} = \frac{-24 \pm 12}{-6} \rightarrow t = \frac{-36}{-6} = 6$$

$$\rightarrow t = \frac{-12}{-6} = 2$$

$\begin{matrix} \infty \\ t < 3 \end{matrix}$

$$\rightarrow \boxed{t=2}$$

$$S'(1) = -\frac{3 \cdot 1}{4} + 6 \cdot 1 - 9 = -$$

$$S'(3) = -\frac{3 \cdot 3^2}{4} + 6 \cdot 3 - 9 = +$$

+	1	2	3
$S'(t)$	\searrow	0	\nearrow
		min	

$$t=2:$$

$$p'01 y = 2tx - t^2 = 4x - 4$$

$$R = y(3) = 4 \cdot 3 - 4 = \boxed{8 = R}$$

~~AAAAA~~

$$S(2) = -\frac{3 \cdot 2^3}{4} + 3 \cdot 2^2 - 9 \cdot 2 + 9 = 1$$

$$\boxed{S=1}$$