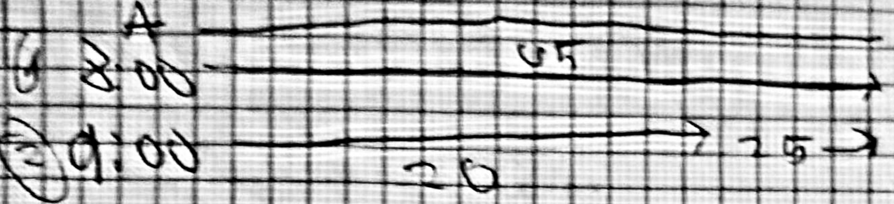
1

581 - 14 зим



S	t	v		
45	$\frac{45}{x+m}$	$x+m$	I
20	$\frac{20}{x}$	x	II

$\frac{20}{x}+1=\frac{45}{x+m}$

$20x+20m+x^2+mx=45x$

$x^2+(m-25)x+20m=0$

$x=\frac{25-m\pm\sqrt{m^2-50m+625-80m}}{2}$

$x_{1,2}=\frac{25-m\pm\sqrt{m^2-130m+625}}{2}$

(c)

$\left|\sqrt{m^2-130m+625}\right|<1 \quad /(\,)^2$

$m^2-130m+625<1$

$m^2-130m+624<0$

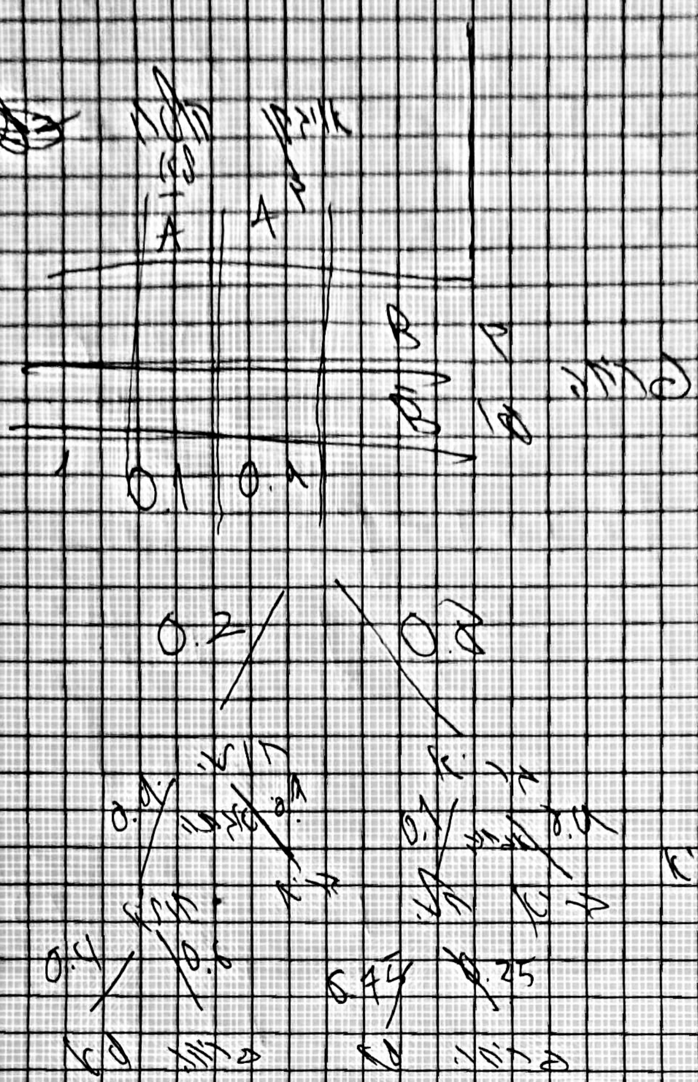
$4<m<126$

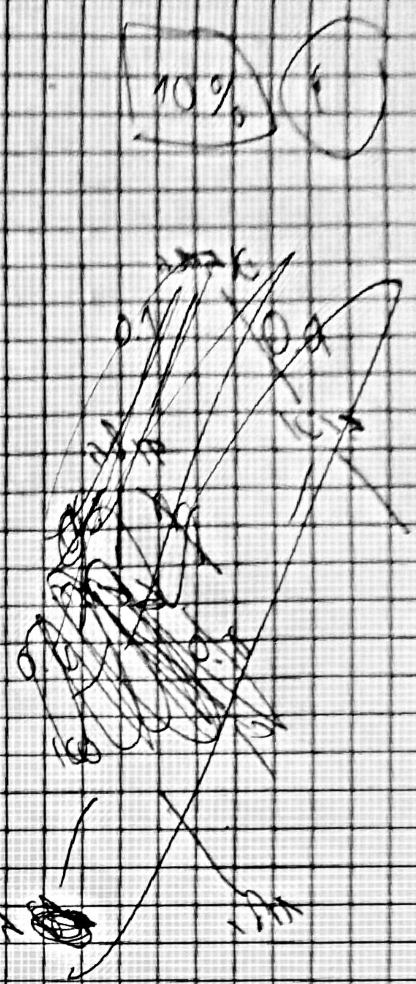
$\boxed{4<m<5}$ (1)

$3\ \ 51$

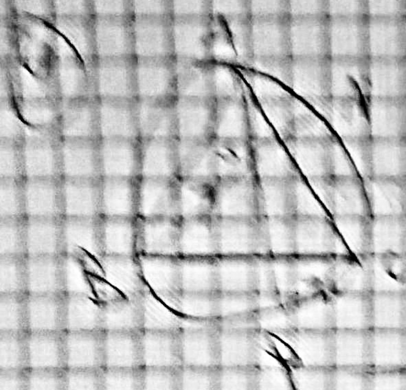
$6=8$

10%

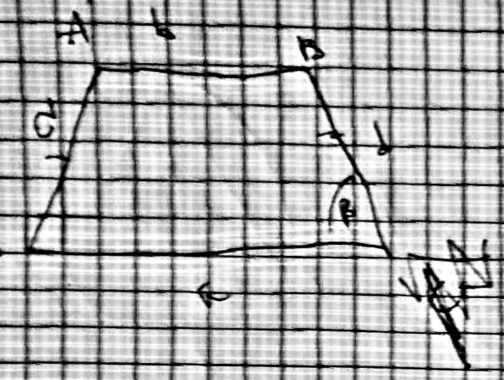




$$\frac{0.2\cdot 0.4\cdot 0.6}{0.8\cdot 0.1\cdot 0.25+0.2\cdot 0.4\cdot 0.6}$$



5



$$BD^2 = d^2 + b^2 - 2db\cos(180-\beta)$$

$$BD^2 = d^2 + a^2 - 2ad\cos\beta$$

$$\frac{BD^2 - d^2 - b^2}{2db} = \frac{d^2 + a^2 - BD^2}{2ad}$$

$$BD^2(a+b) = d^2(a+b) + ab(a+b)$$

$$\boxed{BD = \sqrt{ab + d^2}}$$

$$\frac{a+b}{2} \qquad \frac{a-b}{2}$$

$$AE^2 + \left(\frac{a-b}{2}\right)^2 = d^2$$

$$BE^2 = d^2 - \frac{(a-b)^2}{4}$$

$$BD^2 = \left(\frac{a+b}{2}\right)^2 + BE^2$$

$$BD^2 = \frac{(a+b)^2}{4} + d^2 - \frac{(a-b)^2}{4}$$

$$BD^2 = d^2 + ab$$

$$BD = \sqrt{ab + d^2}$$

$$\frac{\sin\alpha}{\sin(\beta-\alpha)} = \frac{d}{b}$$

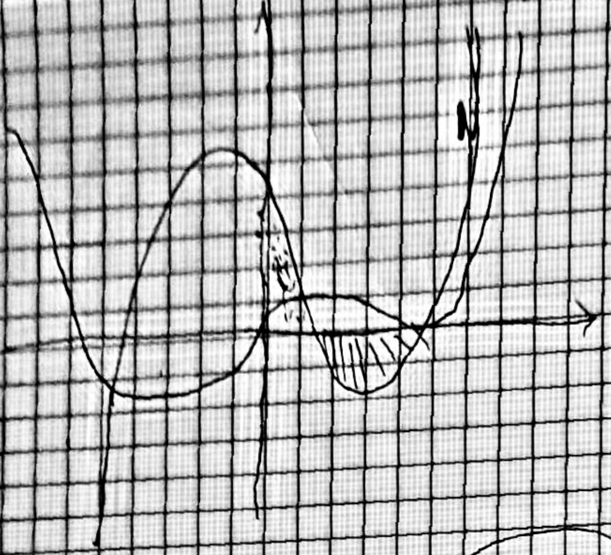
$$d^2 + (ab + d^2 - a^2)$$

$$d^2 = \frac{a^2 - ab}{2}$$

$$\frac{\sin\alpha}{\sin(\beta-\alpha)} = \frac{d}{b} = \frac{\sqrt{a-b}}{\sqrt{2}\,b}$$

381 – 19 3/1N

6



$$S_{III} = f'(0.4) - f'(1) = f'(0.4)$$

$$S_{II} = f'(0.4) - f'(0) = f'(0.4)$$

1

I $f'(x)$

II $f''(x)$

2

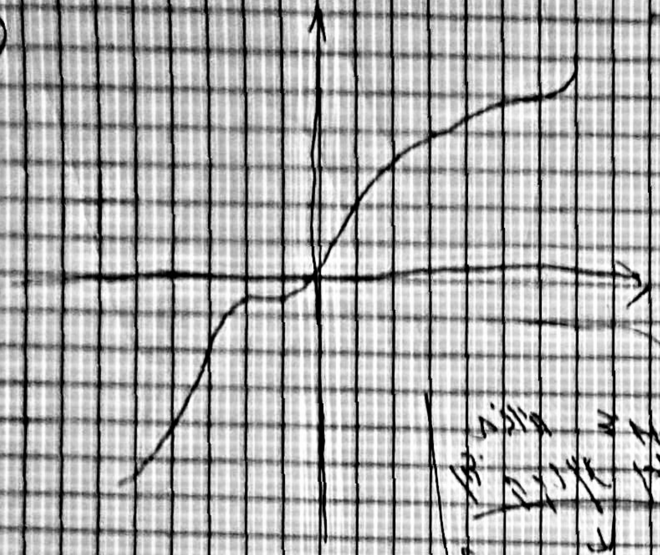
$x = -1, 0, 1$

$-0.4, 0.4, 1 \rightarrow x$

1

7

סעיף ד



$f(x) = x - \frac{\sin(2x)}{2}$

$\boxed{f'(x) = 1 - \cos 2x = 2\sin^2 x}$ 4

נקודת פיתול $f''(x)$ (1) 2

נקודת קיצון $f'(x)$ (2)

$g(x) = x + \sin^2 x$

$g'(x) = 1 + \sin 2x$

$\sin^2 x = 0$

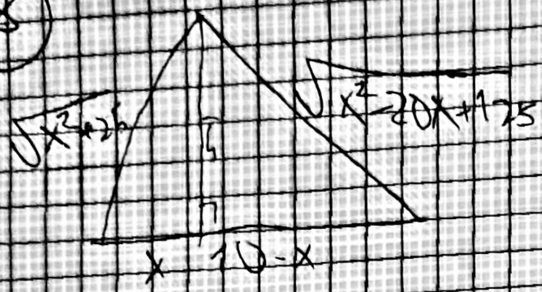
$x = \pi k$

$x = -\pi, 0, \pi$

$$S = \int_{-\pi}^{\pi} \sin^2 x \, dx = \left[\frac{x}{2} - \frac{\sin(2x)}{4}\right]_{-\pi}^{\pi} = \boxed{\pi}$$ 2

58 (D) [illegible]

(8)



$f(x) = 10 + \sqrt{x^2+25} + \sqrt{x^2-20x+125}$

$f'(x) = \frac{2x}{2\sqrt{x^2+25}} + \frac{2x-20}{2\sqrt{x^2-20x+125}} = 0$

$x\sqrt{x^2-20x+125} = (10-x)\sqrt{x^2+25}$

~~$x^4 - 20x^3 + 125x^2 = 100x^2 + x^4 - 20x^3 + 100 + x^2 - 20x$~~

$\frac{10\sqrt{3}}{2}$

~~$2x^2 + 20x - 100 = 0$~~

~~$x = \frac{5}{3}$~~

$\frac{5\sqrt{10}}{3}$ $\frac{5\sqrt{34}}{3}$

$x^2(10-x)^2 + 25(10-x)^2 = 25x^2 + x^2(10-x)^2$

$10 - x = x$

$\boxed{5 = x}$

(E)

$\sqrt{50}, \sqrt{50}, 10$

[illegible]

(4)

$4 \cdot 2'$ (4)

$\frac{S_4 - 3}{4+4} = 3 \cdot \frac{S_4 - 4}{4+4}$

q_1^2

[illegible]

$\frac{a \cdot r q_1^2 (q_1^2 - 1)}{q_1 - 1} = 2 \cdot \frac{a_1 (q_1^2 - 1)}{q_1 - 1}$ b_1

$\frac{b_4}{4} = \frac{1}{1}$ (5)

$q_1^2 = 2$

$\boxed{q_1 = 2}$ (5)

[illegible]

$b_1 = \frac{b_1 (q_1^2 - 1)}{q_1 - 1}$

$\frac{b_1 (q_1^2 - 1)}{1 - q_1}$ $\frac{b_1}{1 - q_1}$

7

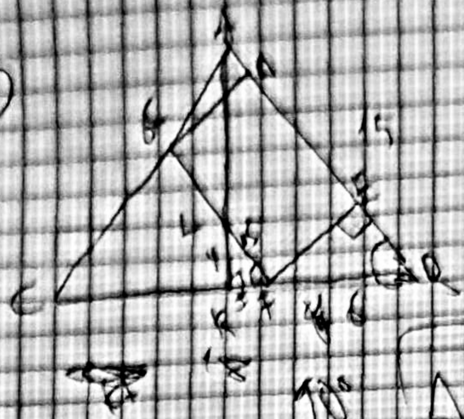
7) 3/4 5/8

$$\frac{11}{1001} = \boxed{\frac{1}{91}}$$

8

$$\frac{22}{45} \cdot \frac{28}{54} \cdot \frac{21}{49} \cdot \frac{20}{34} = \boxed{\frac{10}{221}}$$

7



$AH \perp AL$

$\triangle KAB \sim \triangle KLF \sim \triangle EFB$

$90°$

$\angle KFL = \angle KBA$

$AK = 12$

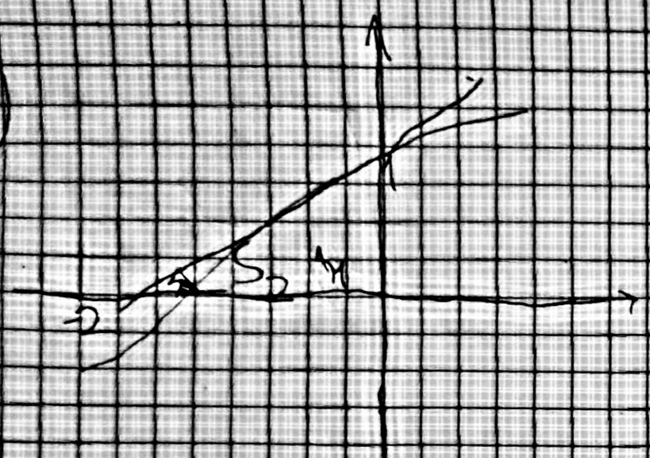
$KL = 4 \quad AK = \sqrt{304}$

$KL = \sqrt{34}$

$KF = 3$

$\frac{6}{5} \cdot 4 = 4.8 = FE$

6



$f(x) = \frac{\cos x}{\sqrt{1-\sin x}}$

$-\frac{3\pi}{2} < x < \frac{\pi}{2}$

$(0, 1)$

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

$S_1 = \int_{-\frac{3\pi}{2}}^{0} \frac{\cos x}{\sqrt{1-\sin x}} = \left[-2\sqrt{1-\sin x}\right]_{-\frac{3\pi}{2}}^{0}$

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

$f'(x) = \frac{2\sin^2 x + \cos^2 x - 2\sin x}{2\sqrt{1-\sin x}\,(1-\sin x)}$

$S_1 = 2S_2 - 2$

$1 + 2 - 2S_2 =$ $\boxed{0,1,1}$

$f'(0) = \frac{1}{2}$

$\boxed{y = \frac{1}{2}x + 1}$

$\int_0$

$$f(x) = \frac{3x}{x-4}$$

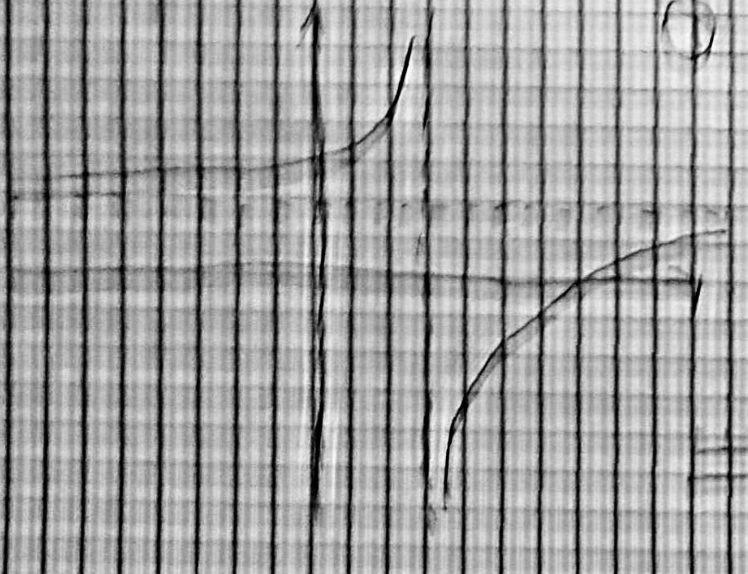
$$f'(x) = \frac{3(x-4) - 3x}{(x-4)^2} = \frac{-12}{(x-4)^2}$$

$x = 4$

$$f''(x) = \frac{24}{(x-4)^3}$$

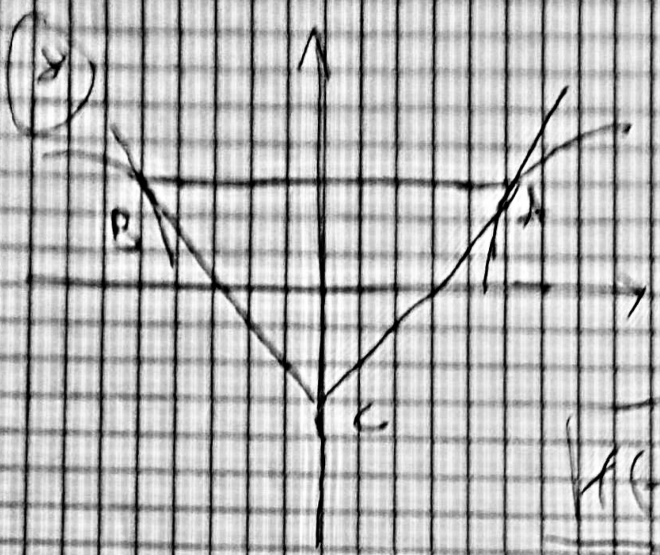
$\Delta = b^2 - 4ac$

(1) (2) (3) (4)



[illegible]

ΘΕΜΑ Δ



$y^2 = x^2 - 24$

$y = \sqrt{x^2-24}$

$\boxed{f(-x) = \sqrt{(-x)^2-24} = \sqrt{x^2-24} = f(x)}$

$S_{ABC} = \frac{2x_A \cdot x_A^2}{2}$

$f'(x) = \frac{x}{\sqrt{x^2-24}}$

$h = y_A - y_C$

$S_{ABC} = \frac{x_A^3}{\sqrt{x_A^2-24}}$

$y_A = \sqrt{x_A^2-24}$

$S'(x) = \frac{3x^2\sqrt{x^2-24} - x^3\frac{x}{\sqrt{x^2-24}}}{x^2-24}$

$AC: y - \sqrt{x_A^2-24} = \frac{x_A(x-x_A)}{\sqrt{x_A^2-24}}$

$S'(x) = \frac{3x^4 - 72x^2 - x^4}{(x^2-24)\sqrt{x^2-24}} \Rightarrow$

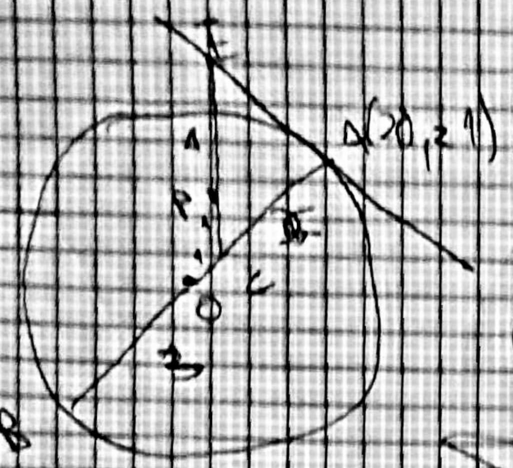
$y_C = \sqrt{x_A^2-24} - \frac{x_A^2}{\sqrt{x_A^2-24}}$

$h = \frac{x_A^2}{\sqrt{x_A^2-24}}$

$x = 6$

$S(6) = \boxed{\frac{216}{\sqrt{12}}} =$ [illegible]

5 d X 2 (1) : 14



$x^2+y^2-4x+6y=87$

$(x-2)^2+(y+3)^2=100$

$(2,-3)$

$x_C=\dfrac{4+20}{3}=8$ $(8,5)$ C

$y_C=\dfrac{-6+21}{3}=5$

$m_{AO}=\dfrac{21+3}{20-2}=\dfrac{4}{3}$

$P(x_P,y_P)$

$x_P=\dfrac{32+x_E}{5}$

$y_P=\dfrac{20+y_E}{5}$

$5x_P-32=x_E$

$5y_P-20=y_E$

2 $E=(5x_P-32,\,5y_P-20)$

$m_{AE}=-\dfrac{3}{4}$

$AE:\ y-21=-\dfrac{3}{4}(x-20)$

$y=-\dfrac{3}{4}x+36$

$5y_P-20=-\dfrac{15x_P}{4}+24+36$

$5y_P+\dfrac{15x_P}{4}=80$

$4y_P+3x_P=64$ (E)

5>2 (1) 3 4N

(4)

$a = 1 - \frac{0.1}{100} = 0.999$

$N(t) = 100 \cdot 0.999^{t}$

$0.001003 = 0.999^{t}$

$\boxed{3 = t}$

$1.15000 = 100 \ldots a^{n}$

$1.15 = a^{n}$

$\boxed{\sqrt[n]{1.15} = a}$

$(0,3)$

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

$f'(x) = \int f''(x)\,dx = \frac{-1}{2(2x-1)} + ex + C$

$f'(0) = 0 \quad 0 = \frac{1}{2} + 0 + C$

$C = -\frac{1}{2}$

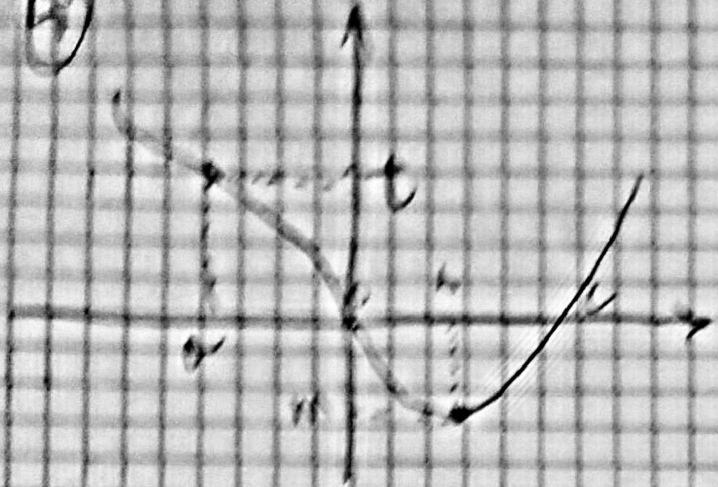
$f(x) = \int f'(x)\,dx = -\frac{1}{4} \ln|2x-1| + \frac{ex^2}{2} - \frac{x}{2} + C$

$f(0) = 3 = 0 + \cancel{\frac{3}{2}} + 0 + 0 + C$

$\boxed{3 = C}$

$f(x) = \frac{-\ln|2x-1|}{4} + \frac{ex^2}{2} - \frac{x}{2} + 3$

(4)



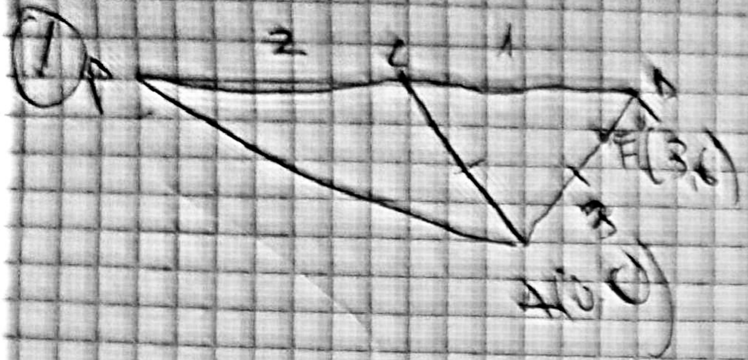
min $\{4, \ldots\}$

max $\{3, 4\}$

(b, e^{-1})

$$\int_b^c f'(x)\, e^{-f(x)}\, dx = \left[-e^{-f(x)}\right]_b^c = \boxed{-e^{-x} + e^{-0}}$$

(1)



$3 = \frac{3x_B + 0}{4}$ $\quad 4 = x_B$

$6 = \frac{3y_B + 0}{4}$ $\quad 8 = y_B$

$B(4,8)$

$PC = 2BC \quad P(x_P, y_P)$

$x_C = \frac{x_P + 8}{3}$ $\quad AB = \sqrt{16+64} = \sqrt{80}$

$y_C = \frac{y_P + 16}{3}$

$\sqrt{80} = \frac{\sqrt{y_P^2 + 32y_P + 256 + x_P^2 + 16x_P + 64}}{3}$

$12\sqrt{5} = \sqrt{(y_P+16)^2 + (x_P+8)^2}$

$720 = (x+8)^2 + (y+16)^2$

$x_C = 4$

$y_C = 8$

$x = 0$

$\boxed{y = 8}$

$x + y \cdot z - 3 = 0$

$B(1,-2,1)$

$A(1,2,1)$

$BG: \Delta + (1+2t, t-2, 2-t)$

$\sqrt{96} = \sqrt{4t^2 + 4t + 1 + t^2 - 4t + 2}$

$0 = 6t^2 - 93$

$t^2 = 15.5$

$2 - 2 - m + 3 = 0$

$\boxed{m = 3}$

$-2 - 2 - k + 3 = 0$

$k = -1$

$\sqrt{96} = \sqrt{4t^2 + t^2 + t^2}$

$16 = t^2$

$\pm 4 = t$

$G(9, 2, -4)$

$G(-7, -6, 6)$

$\vec{AF}$

$F(11, 6, 12)$

$\vec{GE} = (2, 4, -16)$

$\vec{GE}(1, 2, -8)$

$GE: \Delta = (9+2t, 2+4t, -16-8t)$

$1 \cdot 2 + 4t - 2 - 4t - 16 + 24t + 3$

$14t = 28$

$t = 2$

$\Delta = (9+2\cdot 2, 2+4\cdot 2, 1-8\cdot 2)$

$F(1, -2, 15)$

$\vec{AB} = (1, 0, 4)$

$\vec{AF} = (8, 0, 16)$

$\vec{AF} = k\vec{AB}$

(4)

$2 = q_1^t$

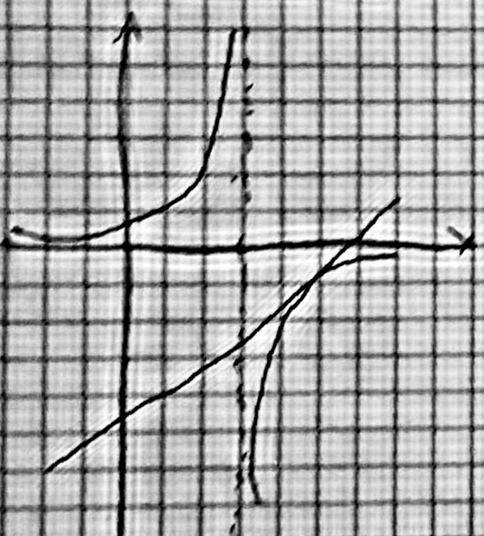
$4 = q_2^t$

$q_1 \cdot 1.08x = q_2$

$\sqrt[t]{2} \cdot 1.08x = \sqrt[t]{4}$

$1.08x^t = 2$

$\boxed{t = 8.30a}$ (c)



(5) 3UN - 9x2

5x3 65

$$\int_{1.5e}^{2e} \left(\frac{4}{e}x - 8 - \left(\frac{e}{e-x} \right) \right) dx$$

$$= \left[\frac{2}{e}x^2 - 8x + e\ln(e-x) \right]_{1.5e}^{2e}$$

$= \boxed{0.455}$ (a)

$f(x) = \frac{e}{e-x}$

$y = \frac{4}{e}x - 8$

$f'(x) = \frac{e}{(e-x)^2} = \frac{4}{e}$

$\cancel{f'(x) = \frac{e}{(e-x)^2} = \frac{4}{e}}$

$\pm e = 2(e-x)$

$x = 0.5e$

$x = 1.5e$

$\cancel{\frac{4}{e}x - 8 = \frac{e}{e-x}}$

$\cancel{4x - \frac{4x^2}{e} - 8e + 8x = e}$

$\cancel{e^2 = 4e^2 - 8ex + 4x^2}$

$x = \frac{3}{2}, \frac{1}{2}$

$\underline{2e = x}$

$(1.5e, -2)$

582 - ⑦ 2014

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

$f''(x) = \frac{2 - 2\ln x + 1}{x^2} = 0$

$3 = 2\ln x$

$\frac{3}{2} = \ln x$

$e^{3/2} = x$

$f'(x) = 0$

$x = \sqrt{e}$

$\boxed{(\sqrt{e}, b-1)}$

$0 < x < e^{3/2}$: U

$e^{3/2} < x$: ∩

$f(x) = \int f'(x)\,dx = \frac{(2\ln x - 1)^2}{4} + c$

$1 + c = b$

$\boxed{c = b - 1}$

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

$\ln x_{1,2} = \frac{1 \pm \sqrt{1 + 3 - 4b}}{2} = \frac{1 \pm 2\sqrt{1-b}}{2}$

$\boxed{b < 1}$

(1) (2)

$0 < b < 1$