

$y = 0.75x - 3.75$, $AB: -3x + 4y + 15 = 0$

$B(5,0)$ $x -$

$x -$ BC

AB , DC

$() 6$

$-3x + 4y + c = 0: DC$

$$\frac{|c-15|}{\sqrt{(-3)^2 + 4^2}} = 6$$

$$|c-15| = 30$$

$$c-15 = 30 \quad c-15 = -30$$

$$c = 45 \quad c = -15$$

$C(-5,0) - x -$

$-3x + 4y - 15 = 0 \quad DC$

$c = -15$

$C(15,0) - x -$

$-3x + 4y + 45 = 0 \quad DC$

$c = 45$

$-3x + 4y + 45 = 0 \quad DC :$

$R = x_C - x_B = 15 - 5 = 10$

$B(5,0)$

$C - A \quad (1)$

$. 10$

$y = 0.75x - 3.75 \quad AB$

$(x-5)^2 + y^2 = 100 \quad (2)$

$1.5625x^2 - 15.625x - 60.9375 = 0 : \quad (x-5)^2 + (0.75x-3.75)^2 = 100 :$

$A(-3, -6) \quad x = -3 -$

$A \quad , \quad , x = 13$

$y = 2x \quad AD$

$(-3x + 4y + 45 = 0) DC \quad y = 2x$

$D(-9, -18) \quad , x = -9 \quad , -3x + 8x + 45 = 0$

$. D(-9, -18) :$

$$y = 0.75x - 3.75 = 0.75(x - 5)$$

AB

:

$$(x - 5)^2 + 0.75^2(x - 5)^2 = 100 \rightarrow \frac{25}{16}(x - 5)^2 = 100$$

$$(x - 5)^2 = 64$$

$$x - 5 = 8 \quad x - 5 = -8$$

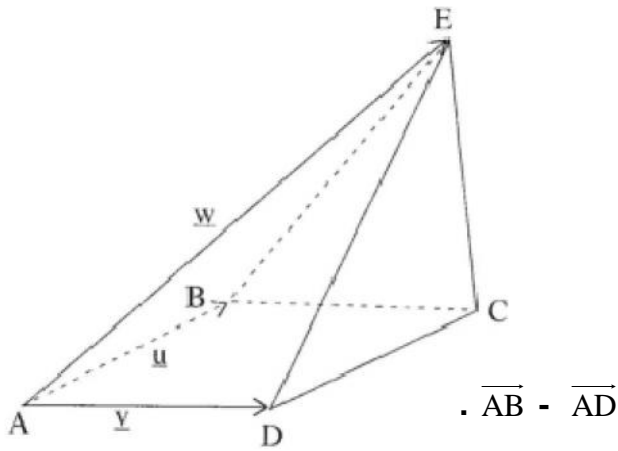
$$x = 13 \quad \rightarrow x = -3$$

$$(x - 5)^2 + 0.75^2(x - 5)^2 = 100 \rightarrow \frac{25}{16}(x - 5)^2 = 100$$

$$(x - 5)^2 = 64$$

$$x - 5 = 8 \quad x - 5 = -8$$

$$x = 13 \quad \rightarrow x = -3$$



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$$\boxed{\vec{AB} = \underline{u}} \quad \boxed{|\underline{u}| = 5} \quad \boxed{\underline{u}^2 = 25}$$

$$\boxed{\vec{AD} = \underline{v}} \quad \boxed{|\underline{v}| = 5} \quad \boxed{\underline{v}^2 = 25}$$

$$\boxed{\vec{AE} = \underline{w}} \quad \boxed{|\underline{w}| = 10} \quad \boxed{\underline{w}^2 = 100}$$

$$\underline{u} \cdot \underline{v} = 0 \leftarrow \underline{u} \perp \underline{v}$$

$$\underline{u} \cdot \underline{w} = 25$$

$$\underline{v} \cdot \underline{w} = 25$$

$$\vec{AD} \cdot \vec{DE} = 0 \quad , \vec{AD} \perp \vec{DE}$$

$$\vec{AD} \cdot \vec{DE} = 0$$

$$\vec{AD} \cdot (\vec{DA} + \vec{AE}) = 0$$

$$\underline{v} \cdot (-\underline{v} + \underline{w}) = 0$$

$$-\underline{v}^2 + \underline{v}\underline{w} = 0$$

$$-25 + \underline{v}\underline{w} = 0$$

$$\boxed{\underline{v}\underline{w} = 25}$$

$$\vec{AE}$$

$$\cos \angle EAD = \cos \angle EAB$$

$$\frac{\vec{AE} \cdot \vec{AD}}{|\vec{AE}| |\vec{AD}|} = \frac{\vec{AE} \cdot \vec{AB}}{|\vec{AE}| |\vec{AB}|}$$

$$\frac{\underline{w}\underline{v}}{5} = \frac{\underline{w}\underline{u}}{5}$$

$$\boxed{25 = \underline{w}\underline{u}}$$

$$\cdot \underline{wu} = 25 \quad , \quad \underline{wv} = 25 \quad :$$

$$|\overline{AH}| = 2\sqrt{17} \quad \overline{EH} = \frac{2}{5}\overline{EC}$$

$$\overline{EH} = \frac{2}{5}\overline{EC}$$

$$\overline{EH} = \frac{2}{5}(\overline{EA} + \overline{AD} + \overline{DC})$$

$$\overline{EH} = \frac{2}{5}\underline{u} + \frac{2}{5}\underline{v} - \frac{2}{5}\underline{w}$$

$$\overline{AH} = \overline{AE} + \overline{EH} = \underline{w} + \frac{2}{5}\underline{u} + \frac{2}{5}\underline{v} - \frac{2}{5}\underline{w}$$

$$\overline{AH} = \frac{2}{5}\underline{u} + \frac{2}{5}\underline{v} + \frac{3}{5}\underline{w}$$

$$|\overline{AH}| = \sqrt{\frac{4}{25}u^2 + \frac{4}{25}v^2 + \frac{9}{25}w^2 + \frac{12}{25}uw + \frac{12}{25}vw}$$

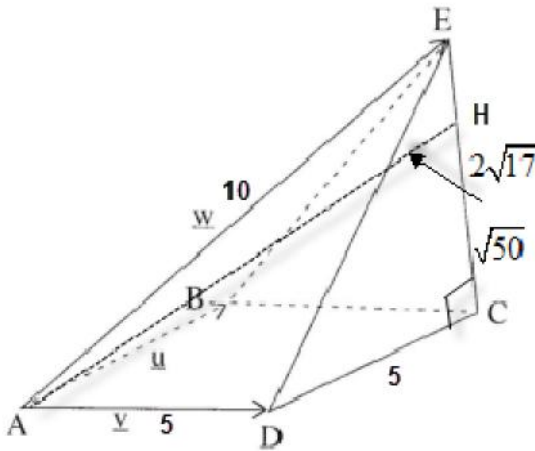
$$|\overline{AH}| = \sqrt{\frac{4}{25} \cdot 25 + \frac{4}{25} \cdot 25 + \frac{9}{25}w^2 + \frac{12}{25} \cdot 25 + \frac{12}{25} \cdot 25} = \sqrt{\frac{9}{25}w^2 + 32}$$

$$|\overline{AH}| = 2\sqrt{17}$$

$$\frac{9}{25}w^2 + 32 = 68$$

$$|w| = 10$$

$\overline{AB} = \underline{u}$	$ \underline{u} = 5$	$\underline{u}^2 = 25$
$\overline{AD} = \underline{v}$	$ \underline{v} = 5$	$\underline{v}^2 = 25$
$\overline{AE} = \underline{w}$	$ \underline{w} = 10$	$\underline{w}^2 = 100$
$\underline{u} \cdot \underline{v} = 0 \leftarrow \underline{u} \perp \underline{v}$		
$\underline{u} \cdot \underline{w} = 25$		
$\underline{v} \cdot \underline{w} = 25$		



$$S_{\Delta EDC} = 2.5\sqrt{50}$$

.10 AE :

$$\overline{DC} \cdot \overline{CE} = 0, \overline{DC} \perp \overline{CE} \quad (1)$$

$$\overline{DC} \cdot \overline{CE} = \overline{DC} \cdot (\overline{CD} + \overline{DA} + \overline{AC})$$

$$\overline{DC} \cdot \overline{CE} = \underline{u} \cdot (-\underline{u} - \underline{v} + \underline{w}) = 0$$

$$\overline{DC} \cdot \overline{CE} = -\underline{u}^2 + \underline{u}\underline{w} = 0$$

$$\overline{DC} \cdot \overline{CE} = -25 + 25 = 0$$

$$\overline{DC} \cdot \overline{CE} = 0$$

$$|\overline{EC}| = |-\underline{w} + \underline{v} + \underline{u}|$$

$$|\overline{EC}| = \sqrt{\underline{w}^2 + \underline{v}^2 + \underline{u}^2 - 2\underline{v}\underline{w} - 2\underline{u}\underline{w}}$$

$$|\overline{EC}| = \sqrt{100 + 25 + 25 - 50 - 50} = \sqrt{50}$$

$$S_{\Delta EDC} = \frac{|\overline{EC}| \cdot |\overline{DC}|}{2} = \frac{\sqrt{50} \cdot 5}{2} = 2.5\sqrt{50}$$

ΔEDC :

ΔEDC $AEDC$ ΔEDC \overline{AD} ,

$\cdot V_{AEDC} = \frac{S_{\Delta EDC} \cdot AD}{3} = \frac{2.5\sqrt{50} \cdot 5}{3} = 29.46$

$\cdot 29.46$ $AEDC$:

$$z^2 - 2Rcis_{\theta} z - 3R^2 cis 2_{\theta} = 0$$

$$z_{1,2} = \frac{2Rcis_{\theta} \pm \sqrt{(2Rcis_{\theta})^2 - 4 \cdot 1 \cdot (-3R^2 cis 2_{\theta})}}{2 \cdot 1}$$

$$z_{1,2} = \frac{2Rcis_{\theta} \pm \sqrt{4R^2 cis 2_{\theta} + 12R^2 cis 2_{\theta}}}{2}$$

$$z_{1,2} = \frac{2Rcis_{\theta} \pm \sqrt{16R^2 cis 2_{\theta}}}{2} = \frac{2Rcis_{\theta} \pm \sqrt{16R^2 (cis_{\theta})^2}}{2}$$

$$z_{1,2} = \frac{2Rcis_{\theta} \pm 4Rcis_{\theta}}{2}$$

$$z_1 = 3Rcis_{\theta} \quad (1st \text{ quadrant})$$

$$z_2 = -Rcis_{\theta}$$

$$z_2 = Rcis(\theta + 180^{\circ}) = Rcis_{\theta} - Rcis_{\theta}$$

$$z_2 = Rcis(\theta + 180^{\circ}), \quad z_1 = 3Rcis_{\theta} :$$

$$y = \frac{\sqrt{3}}{3} x \quad z_2 - z_1$$

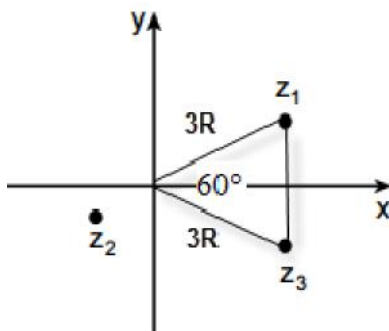
$$\theta = 30^{\circ} \quad (x -$$

$$\theta) \quad m = \tan \theta = \frac{\sqrt{3}}{3}$$

$$\theta = 30^{\circ} :$$

$$z_2 = Rcis 210^{\circ} - z_1 = 3Rcis 30^{\circ} \quad (1)$$

$$z_3 = \bar{z}_1 = 3Rcis(-30^{\circ})$$



$$z_1 Oz_3$$

$$\angle z_1 Oz_3 = 30^{\circ} + 30^{\circ} = 60^{\circ} \quad (2)$$

$$S_{z_1 Oz_3} = 225\sqrt{3}$$

$$225\sqrt{3} = \frac{3R \cdot 3R \sin 60^{\circ}}{2}$$

$$100 = R^2$$

$$\boxed{R = 10}$$

$$R = 10 :$$

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$f(x) = -3x^2 e^{x^3}$

$f(5) = -1.45 \cdot 10^{56} \rightarrow -\infty$, $f(-5) = -3.8 \cdot 10^{-53} \rightarrow 0^-$:

$y = 0$

(1)

$f'(x) = -6xe^{x^3} - 3x^2 \cdot 3x^2 \cdot e^{x^3}$

$f'(x) = 3e^{x^3} (-2x - 3x^4)$

$0 = x(-2 - 3x^3)$

$x = 0$, $x = \sqrt[3]{-2/3} = -0.873$

$(0,0)$, $(-0.873, -1.175)$

(y)

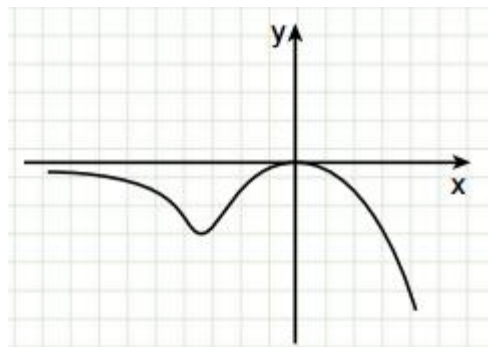
$(0,0)$, $(-0.873, -1.175)$ -

$(0,0)$ - , $(-0.873, -1.175)$:

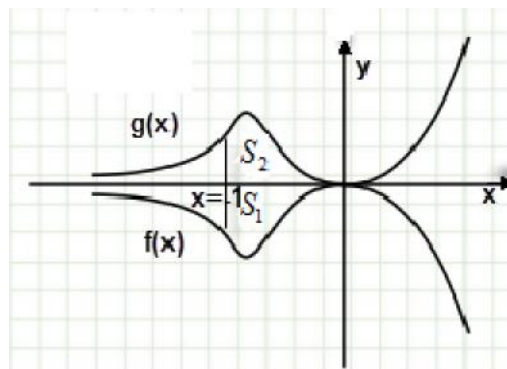
$(0,0)$

(2)

(3)



x - , - $g(x) = |f(x)| = -f(x)$ (4)



$$S_1 = S_2 \quad , \quad , x \quad .$$

$$S_2 = \int_{-1}^0 (e^{x^3} \cdot 3x^2) dx$$

$$S_2 = e^{x^3} \Big|_{-1}^0$$

$$\left. \begin{array}{l} x=0: e^{0^3} = 1 \\ x=-1: e^{(-1)^3} = \frac{1}{e} \end{array} \right\} S_2 = 1 - \frac{1}{e} \rightarrow S_2 + S_1 = 2 - \frac{2}{e}$$

$$2 - \frac{2}{e} \quad :$$

$$a \geq -1 \quad , \quad h(a) = \int_{-1}^0 f(x) dx = - \int_{-1}^0 g(x) dx \quad , \quad t(a) = \int_{-1}^0 g(x) dx \quad .$$

$$h(a) = -t(a) \quad :$$

$$t(a) = 0 \quad h(a) = -t(a) \quad , \quad h(a) = t(a) \quad ,$$

$$(-1, 0) \quad x \quad g(x) \quad , \quad x = -1 \quad S_2 \quad t(a) = 0$$

$$(-1, 0) \quad t(a) = h(a) \quad , \quad a = -1$$

$$(-1, 0) \quad :$$

$$f(x) = \frac{x^2}{2} \left(\frac{1}{2} - \ln x \right)$$

$$x > 0 \quad (1)$$

$$f(0.0001) = 4.86 \cdot 10^{-8} \rightarrow 0^+ \quad , f(10000) = -6.66 \cdot 10^{12} \rightarrow -\infty :$$

$$(0, 0) -$$

$$x - \quad (2)$$

$$0 = \frac{1}{2} - \ln x$$

$$\ln x = \frac{1}{2} \rightarrow x = \sqrt{e}$$

$$(\sqrt{e}, 0) :$$

$$(3)$$

$$f(x) = \frac{x^2}{2} \left(\frac{1}{2} - \ln x \right)$$

$$f'(x) = \frac{1}{2} \left[2x \left(\frac{1}{2} - \ln x \right) - \frac{x^2}{x} \right]$$

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

$$\boxed{f'(x) = -x \ln x}$$

$$\ln x = 0 \rightarrow x = 1 \rightarrow (1, 0.25)$$

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

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

$$f''(1) = -1 < 0 \rightarrow \text{Max}$$

$$(1, 0.25) :$$

$$(1) .$$

$$0 = -\ln x - 1$$

$$\ln x = -1 \rightarrow x = \frac{1}{e} \rightarrow \left(\frac{1}{e}, \frac{1}{e} \right)$$

$$f'''(x) = -\frac{1}{x} < 0 \rightarrow \left(\frac{1}{e}, \frac{1}{e} \right), \text{Max}$$

$$\left(\frac{1}{e}, \frac{1}{e} \right) :$$

$$f'(0.0001) = 9.2 \cdot 10^{-4} \rightarrow 0^+ \quad , f(10000) = -92103 \rightarrow -\infty :$$

$$(0, 0) -$$

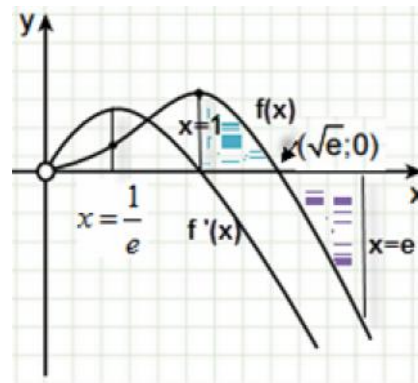
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(2)

$$f\left(\frac{1}{e}\right) = \frac{(1/e)^2}{2} \left(\frac{1}{2} - \ln\left(\frac{1}{e}\right)\right) = \frac{1}{2e^2} \cdot \frac{3}{2} = \frac{3}{4e^2} \cdot x = \frac{1}{e}$$

$$\left(\frac{1}{e}, \frac{3}{4e^2}\right) :$$

(1)



$$\frac{1}{e} < x < 1 \quad (2)$$

$$g(e) = c, \quad g(\sqrt{e}) = b, \quad g(1) = a, \quad g'(x) = f(x) :$$

$$\int_1^{\sqrt{e}} (f(x)) dx = g(x) \Big|_1^{\sqrt{e}}$$

$$\left. \begin{array}{l} x = \sqrt{e}: \quad g(\sqrt{e}) = b \\ x = 1: \quad g(1) = a \end{array} \right\} = b - a$$

$$\int_{\sqrt{e}}^e (0 - f(x)) dx = -g(x) \Big|_{\sqrt{e}}^e$$

$$\left. \begin{array}{l} x = e: \quad -g(e) = -c \\ x = \sqrt{e}: \quad -g(\sqrt{e}) = -b \end{array} \right\} = -c + b$$

$$2b - a - c :$$