$x_s = 2$

$\frac{-1}{2(a-1)} = 2 \rightarrow a = \frac{3}{4}$

$y=0 = -\frac{x^2}{4} + x + 3 \rightarrow x = \frac{-1 \pm \sqrt{1+3}}{-\frac{1}{4}} = \begin{cases} x=6 \checkmark \\ x=-2 \text{ غ ق ق} \end{cases}$

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$m < 0$

$\Delta > 0 \rightarrow 20 - 4m^2 > 0 \rightarrow m^2 < \frac{20}{4} \rightarrow -\frac{\sqrt{5}}{2} < m < \frac{\sqrt{5}}{2}$ ∩ $(-2, 0)$

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$S = \frac{3-\sqrt{5}+3+\sqrt{5}}{3} = 2$

$P = \frac{(3-\sqrt{5})(3+\sqrt{5})}{9} = \frac{4}{9}$

$y = ax^2+bx+c = x^2 - 2x + \frac{4}{9} = 9x^2 - 18x + 4$

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$\Delta > 0 \rightarrow 64 - 8(m+2) > 0 \rightarrow 8 > m+2 \rightarrow m < 6$

$\alpha + \beta = 4 \qquad \alpha\beta = \frac{m+2}{2}$

$\alpha^2 + \beta^2 + \underbrace{2\alpha\beta}_{m+2} = 14$

$\alpha = \frac{8 - \sqrt{64 - 8m - 16}}{4} = 2 - \frac{\sqrt{4}\sqrt{12-m}}{2} = 2 - \sqrt{12-m}$

$2\alpha^2 = (4 + 12 - 4m - 4\sqrt{12-m}) \times 2 = 32 - 8m - 8\sqrt{12-4m}$

$2\alpha^2 + \beta^2 = 32 - 8m - 8\sqrt{12-4m} + 16 - 2m = 48 - 9m - 8\sqrt{12-4m} = 12 \rightarrow \frac{16-9m}{8} = \sqrt{12-4m} = 2 - \frac{9}{8}m$

$3 - 4m = 4 + \frac{81}{64}m^2 - \frac{9}{4}m$

$\frac{369}{64}m = -1$

$m = -\frac{64}{369}$

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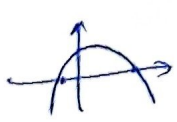
$y = a(x-2)^2 + 9$

$4a + 9 = 0 \rightarrow a = -1$

$y = -x^2 + 4x + 5$ → $x = -1$, $x = 5$



$\rightarrow (-1, 5)$

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$\frac{1}{\alpha}+\frac{1}{\beta}=\frac{\alpha+\beta}{\alpha\beta}$

$\alpha+\beta=\frac{-7}{4}$

$\alpha\beta=9\frac{\beta}{\alpha}\rightarrow \alpha^2=9 \rightarrow \alpha=\pm 3$

$\alpha=-3 \rightarrow \beta=-\frac{7}{4}-(-3)=\frac{5}{4}$ ✓

$\alpha=3 \rightarrow 3+\beta=\frac{-7}{4} \rightarrow \beta=-\frac{19}{4}$ غ ق ق

$\rightarrow \alpha=-3,\ \beta=\frac{5}{12}$

$\rightarrow \frac{\alpha+\beta}{\alpha\beta}=\frac{-\frac{37}{12}}{-\frac{15}{12}}=\boxed{\frac{37}{15}}$

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$\alpha+\beta=-m \qquad \alpha\beta=-2m \qquad \alpha^2=2m-\alpha m$

$2m-m\alpha+m\beta=8 \rightarrow 2m-m(-m)=8$

$\rightarrow m^2+2m-8=0 \rightarrow (m-2)(m+4)=0$

$\boxed{m=2}$ ق ق

$m=-4$ غ ق ق

$m=2 \rightarrow \alpha+\beta=-2 \quad \alpha\beta=4$

$m=-4 \rightarrow \alpha+\beta=4 \quad \alpha\beta=8$

$\rightarrow \alpha+\beta=-(2)=\boxed{-2}$

$\Delta>0 \rightarrow m^2+8m>0$

	-8		0	
	+	−	−	+
	ج			ج

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$y_s=\frac{-\Delta}{4a}=8 \rightarrow \frac{-(16-4m(7+\frac{m}{2}))}{4m}=8 \rightarrow \frac{-16+28m+2m^2}{4m}-8=0$

$\frac{2m^2+28m-16}{4m}$

$2m^2-8=0 \rightarrow m=\pm 2\sqrt{2}$

$\frac{m^2-m-8}{m}=\frac{(m-4)(m+2)}{m}=0$

$\rightarrow m=-2$

$S=\frac{-b}{2a}>0 \rightarrow \frac{-m}{2m}>0 \rightarrow \boxed{m<0}$

$P=\frac{+c}{a}<0 \rightarrow \frac{7+\frac{m}{2}}{m}<0 \rightarrow 7+\frac{m}{2}>0 \rightarrow \boxed{m>-14}$

$x=\frac{-4\pm\sqrt{64}}{2(-4)}=-1,6$

$\rightarrow \boxed{x=6}$

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$\frac{1}{\alpha}+\frac{1}{\beta}=?$

$y=a(x-2)^2+4 \rightarrow y=-\frac{x^2}{2}+2x+2$

$S=\alpha+\beta=\frac{-2}{-\frac{1}{2}}=4$

$P=\alpha\beta=\frac{2}{-\frac{1}{2}}=-8$

$4a+4=2 \rightarrow a=-\frac{1}{2}$

$\frac{\alpha+\beta}{\alpha\beta}=\frac{4}{-8}=\boxed{-\frac{1}{2}}$

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$2-(4a+4)2+3a^2+4a+2=0$

$2-8a-8+3a^2+4a+2=3a^2-2a-1=0 \begin{cases} \rightarrow a=1 \\ \rightarrow a=-\frac{1}{3} \end{cases}$

$S=\alpha+\beta=\frac{4a+2}{2}=2a+2 \begin{cases} \rightarrow a=1 \rightarrow (2), P=12\neq 8 \text{ غ ق ق} \\ \rightarrow a=-\frac{1}{3} \rightarrow (3), P=\frac{32}{9}\neq\frac{2}{3} \text{ غ ق ق} \end{cases}$

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