大阪病院協会　H22 後期

Ⅰ、(1) $(-a^2)^3 = -a^6$

(2) $\frac{4\sqrt{5}}{1+\sqrt{5}} = \frac{4\sqrt{5}(1-\sqrt{5})}{1-5}$

$= -\sqrt{5}(1-\sqrt{5})$

$= 5-\sqrt{5}$

(3) $\tan\theta + \frac{1}{\tan\theta} = \frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}$

$= \frac{\sin^2\theta+\cos^2\theta}{\sin\theta\cos\theta} = \frac{1}{\sin\theta\cos\theta}$

Ⅱ、(1) $f(x) = a(x-3)^2+4$ ← (5,0)代入

$\therefore a = -1$

$f(x) = -(x-3)^2+4$

$= -x^2+6x-5$

(2) $-x^2+6x-5 = 0$ より

$(x-1)(x-5) = 0$

$x = 1, 5$ より

$\therefore (1,0), (5,0)$

(3) $-x^2+6x-5 = -5$

$x^2-6x = 0$

$x(x-6) = 0$

$\therefore x = 0, 6$

(4) y軸対称

$y = -(-x)^2+6(-x)-5$

$= -x^2-6x-5$

$= -(x+3)^2+4$

頂点 $(-3,4) \Rightarrow (-1,4)$

Ⅲ、5の倍数：$100 \div 5 = 20$

9の倍数：$100 \div 9 \fallingdotseq 11$

45の倍数：$100 \div 45 \fallingdotseq 2$

(1) $20 - 2 = 18$個

(2) $20 + 11 - 2 = 29$個

Ⅳ、(1) $\frac{{}^{1}\cancel{6}\times{}^{1}\cancel{3}}{{}_{2}\cancel{6}\times\cancel{6}_{2}} = \frac{1}{4}$

(2) $1 - \frac{{}^{1}\cancel{6}}{\cancel{36}_{6}} = \frac{5}{6}$

(3) 4未満になるのは、

(1,1), (1,2), (2,1) の3通り

$\therefore 1 - \frac{{}^{1}\cancel{3}}{\cancel{36}_{12}} = \frac{11}{12}$

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$\therefore 1 - \frac{3\times3}{36} = \frac{3}{4}$