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$x = \frac{1}{\sqrt{5}+2}$, $y = \frac{1}{\sqrt{5}-2}$ のとき、次の式の値を求めなさい。

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

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

$$(3) \quad x^2 + y^2 \quad x + y = 2\sqrt{5}, \quad xy = 1$$

$$(x + y)^2 - 2xy = (2\sqrt{5})^2 - 2 \times 1 = 20 - 2 = 18$$

$$(4) \quad \frac{1}{x} + \frac{1}{y} \quad x + y = 2\sqrt{5}, \quad xy = 1$$

$$\frac{y}{xy} + \frac{x}{xy} = \frac{x+y}{xy} = \frac{2\sqrt{5}}{1} = 2\sqrt{5}$$

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$\sqrt{2} = 1.4142$ とするとき、分母の有理化を利用して、次の式の値を計算せよ。

$$(1) \quad \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} \quad \text{有理化} = \frac{\sqrt{2}}{2} = \sqrt{2} \div 2 = 1.4142 \div 2 = 0.7071$$

$$(2) \quad \frac{\sqrt{2}}{\sqrt{2}-1} \times \frac{(\sqrt{2}+1)}{(\sqrt{2}+1)} \quad \text{有理化} = \frac{2+\sqrt{2}}{2-1} = 2 + \sqrt{2} = 2 + 1.4142 = 3.4142$$

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(1) $2\sqrt{5}$	(2) 1	(3) 18	(4) $2\sqrt{5}$
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(1) 0.7071	(2) 3.4142
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