

1	1	$6x^2 - 3xy$	2	$x^2 + 10x + 24$
	3	$x^2 - 25$	4	$6x - 3/$

10各3点、

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2	1	$a(2x + 3y)$	2	$(x+2)(x+3)$
	3	$(x-12)(x-3)$	4	$(x+2)^2$
	5	$4(2x+y)(2x-y)$	6	$(a+b-3c)(a-b+3c)$

2 (5)以外
各3点、
(5)4点、

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3	1	2	2	10個
	3	多項式をいくつかの因数の積の形で表すこと。		
	4	$25 \times 2019^2 - 25 \times 2015^2 = 25 \times 4034 \times 44$ $= 25 \times (2019^2 - 2015^2) = 4034 \times 100$ $= 5 \times (2019 + 2015) \times (2019 - 2015) = \underline{403400}$		
	5	最小	3	3つ目
6	縦	$x+3$		横
				$x+2$

3 各2点、

(5)(6)
完答

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4	1	①	± 3	②	± 0.4	③	$\pm \sqrt{2}$
	2	①	3	②	-9	③	64
	3	①	$3\sqrt{2}$	②	0.5	③	$\frac{6}{7}$

4 各2点、

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4	4	ア	無理数	イ	循環小数	ウ	有理数	4	(4) 各 2 点
		エ	10	オ	5	カ	$-\sqrt{15}$	(5) (6)	
5	①	4		②	16		各 3 点		
6	24 個				/ 2				

5	1	2n 倍数	
2	①	n ∈ 整数	
	②	2n+1, 2n+3 [2n-1, 2n+1]	
	③	$(2n+1)^2 + (2n+3)^2$ [$(2n-1)^2 + (2n+1)^2$]	
	④	$2(4n^2 + 8n + 5)$ [$2(4n^2 + 1)$]	
	⑤	$4n^2 + 8n + 5$	[$4n^2 + 1$] ⑥ 整数
	⑦	$2(4n^2 + 8n + 5)$	[$2(4n^2 + 1)$]

6	1	①	$2(3h+a) + 2(h+a)$		各 2 点
		②	$4(2h+a)$	[$8h+4a$]	10
2	①	$(h+2a)(3h+2a) - h \times 3h$			
	②	$4a(2h+a)$	[$8ah + 4a^2$]		
3	$4a(2h+a)$		[$8ah + 4a^2$]		

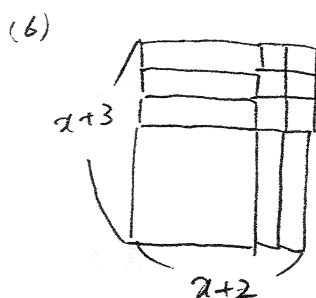
<解説>

$$\begin{aligned} 2(5) \quad & 16x^2 - 4y^2 \\ & = 4(4x^2 - y^2) \quad \left[\begin{array}{l} \text{共通因数} \\ \text{2をくく} \end{array} \right] \\ & = 4(2x+y)(2x-y) \end{aligned}$$

$$\begin{aligned} (6) \quad & a^2 - b^2 + 6bc - 9c^2 \\ & = a^2 - (b^2 - 6bc + 9c^2) \quad \left[\begin{array}{l} \text{二コエではない!} \\ \text{1:3で割る!} \end{array} \right] \\ & = a^2 - (b-3c)^2 \\ & = a^2 - A^2 \end{aligned}$$

$$\begin{aligned} 3(5) \quad & 12 = 2^2 \times 3^1 \\ & m_1 = 3 \\ & m_2 = 3 \times 2^2 = 12 \\ & m_3 = 3 \times 3^2 = 27 \end{aligned}$$

$$\begin{aligned} & (a+A)(a-A) \\ & = (a+b-3c) \{ a - (b-3c) \} \\ & = (a+b-3c)(a-b+3c) \end{aligned}$$



$$4. (5) \textcircled{2} \quad x+y=-5, \quad xy=3$$

$$\begin{aligned} & x^2 - 2xy + y^2 \\ & = \frac{x^2 + y^2}{11} - xy \\ & \textcircled{※} = \frac{(x+y)^2 - 2xy - xy}{11} \\ & = \frac{(x+y)^2 - 3xy}{11} \leftarrow \text{代入} \\ & = \frac{(-5)^2 - 3 \times 3}{11} \\ & = \frac{25 - 9}{11} \\ & = \frac{16}{11} \end{aligned}$$

(6) 10を作るには 5×2 が必要
 2は偶数だから何回でもOK。(1回でもあり)
 よって1~100の間に5がいくつあるかを考える
 $100 \div 5 = 20 \square$
 25は5で22おこるから
 $100 \div 25 = 4 \square$ (追加)
 $20 + 4 = 24 \square$

7	1	$5 - 2\sqrt{6} - 2\sqrt{3}$	2	0
	3	$14 - 6\sqrt{2}$	4	$4\sqrt{14}$

□ 各2点

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8	1	$5 + \sqrt{5}$	2	22
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9	1	$a+b$	$2\sqrt{7}$	$a-b$	4	ab	3
	2	$8\sqrt{7}$	3	3/			

10	1	$a = \sqrt{3} - 1$	2	3	3	$3 + \sqrt{3}$
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□ 各2点

/ 6

11	1	$a = 10$	2	$x = 2, f$	3	$m = 30$
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□ 各2点

/ 6

$$7(1) (\sqrt{2} - \sqrt{3})^2 + \sqrt{12}$$

$$= 2 - 2\sqrt{6} + 3 + 2\sqrt{3}$$

$$= 5 - 2\sqrt{6} + 2\sqrt{3}$$

$$(2) (\sqrt{5} + \sqrt{3})(\sqrt{5} - \sqrt{3}) - 2$$

$$= 5 - 3 - 2$$

$$= 0$$

$$(3) (\sqrt{2} + 3)^2 - \sqrt{3}(4\sqrt{6} - \sqrt{3})$$

$$= 2 + 6\sqrt{2} + 9 - \frac{12\sqrt{2}}{\sqrt{3}} + 3$$

$$= 14 - 6\sqrt{2}$$

$$(4) (\sqrt{7} + \sqrt{2})^2 - (\sqrt{7} - \sqrt{2})^2$$

$$= 7 + 2\sqrt{14} + 2 - (7 - 2\sqrt{14} + 2)$$

$$= 9 + 2\sqrt{14} - (9 - 2\sqrt{14})$$

$$= 9 + 2\sqrt{14} - 9 + 2\sqrt{14}$$

$$= 4\sqrt{14}$$

$$A = \sqrt{7} + \sqrt{2}, B = \sqrt{7} - \sqrt{2}$$

$$(8) A^2 - B^2$$

$$= (A+B)(A-B)$$

$$= 2\sqrt{7} \times 2\sqrt{2}$$

$$= 4\sqrt{14}$$

8 (1) $x = \sqrt{5} + 1$

$$x^2 - x = x(x-1)$$

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

$$= (\sqrt{5}+1) \times \sqrt{5}$$

$$= 5 + \sqrt{5}$$

(2) $a = \sqrt{2}$ $b = -\sqrt{3}$

$$(a+2b)^2 + 4a(a-b)$$

$$= a^2 + 4ab + 4b^2 + 4a^2 - 4ab$$

$$= 5a^2 + 4b^2$$

$$= 5 \times (\sqrt{2})^2 + 4 \times (-\sqrt{3})^2$$

$$= 5 \times 2 + 4 \times 3$$

$$= 22$$

9 (2) $a+b = 2\sqrt{7}$ $a-b = 4$ $ab = 3$ (3) $\frac{a^2+b^2}{2} + 3ab$

$$a^2 - b^2 = (a+b)(a-b)$$

$$= 2\sqrt{7} \times 4$$

$$= 8\sqrt{7}$$

$$= \frac{(a+b)^2 - 2ab}{2} + 3ab$$

$$= \frac{(a+b)^2}{2} + ab$$

$$= \frac{(2\sqrt{7})^2}{2} + 3$$

$$= 28 + 3 = 31$$

10 (1) $1 < 3 < 4$

↓平方根

$$1 < \sqrt{3} < 2$$

整数部

$$a = \sqrt{3} - 1$$

(2) $(a+1)^2$

$$= (\sqrt{3}-1+1)^2$$

$$= (\sqrt{3})^2$$

$$= 3$$

(3) $a^2 + 3a + 2$

$$= (a+1)(a+2)$$

$$= (\sqrt{3}-1+1)(\sqrt{3}-1+2)$$

$$= \sqrt{3} \times (\sqrt{3}+1)$$

$$= 3 + \sqrt{3}$$

11. (1) $\sqrt{90a}$

$$90 = 2' \times 3^2 \times 5'$$

$$\downarrow \times 2$$

$$2^2$$

$$\downarrow \times 5$$

$$5^2$$

$$a = 2 \times 5 = 10$$

(2) $\sqrt{18x}$

$$18 = 2' \times 3^2$$

$$\downarrow \times 2$$

$$2^2$$

$$x_1 = 2$$

$$x_2 = 2 \times 2^2 = 8$$

$$x_3 = 2 \times 3^2 = 18 \leftarrow 2 \times 9 \text{ だけ } 3 \times$$

$$\underline{x = 2, 8}$$

(3) $\sqrt{\frac{24m}{5}}$

大前提より、分母の5を約分できるから
mは5の倍数である。

$$24 = 2^3 \times 3 \quad \downarrow \text{2乗する必要がある}$$

$$= 2^2 \times 2' \times 3'$$

$$\downarrow \times 2$$

$$2^2$$

$$\downarrow \times 3$$

$$3^2$$

$$m = 2 \times 3 \times 5$$

$$\underline{m = 60}$$