

問1

(1)	(ア) 〇 ^②	(イ) × ^②	(ウ) × ^②	(エ) 〇 ^②	(2) -2, 1 ^②
(3)	解が1つ 7 ^②	解が2つ 1 ^②	(4) (a) ±9 ^②	(b) 7 ^②	
(4)	(c) 5 ^②	(d) 5 ^②			
(5)	有理数 -0.1, $\sqrt{64}$, $\frac{1}{3}$	無理数 $\sqrt{2}$, $-\frac{\sqrt{2}}{5}$, π	(6)	$0 \times \sqrt{2} = 0$ ↑ $\pi \cdot \sqrt{3}$	

(各1点) (各1点) (各1点)

知識
/ 25

問2

(1)	11 ^②	(2)	28 ^②	(3)	-1/5 ^②	(4)	56 ^②
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技能
/ 8

問3

(1)	x = 3 ^②	(2)	① 1 [△]	② I [△]
	y = -2			
(3)	(a) 1/6 [△]	(b)	1/2 [△]	

技能
/ 6

問4

(1)	3√3 ^②	(2)	√6 ^②
(3)	4√5 ^②	(4)	-3 ^②

技能
/ 8

問5

(1)	x = ±√3 ^②	(2)	x = 0, 5 ^②	(3)	x = -2, -7 ^②
(4)	x = $\frac{-3 \pm \sqrt{29}}{2}$ ^②	(5)	x = 3 ± √10 ^②	(6)	x = 8, -1 ^②
(7)	x = 1 ^②				

技能
/ 14

問6

(1)	n = 2 ^②	(2)	n = 21 ^②	(3)	n = 0, ±3, ±4 ^②
(4)	4√15 ^②	(5)	38 ^②		

考え方
/ 10

問7

(解答係)

0.45 = x とする

$$\begin{array}{r} 100x = 45.45 \\ -) \quad x = 0.45 \\ \hline 99x = 45 \end{array}$$

$x = \frac{45}{99}$
 $x = \frac{5}{11}$

$A \ 0.45 = \frac{5}{11}$

考え方
/ 4

問8

(1)	b = √2 a ^②	(2)	b = 21.2 ^②	(3)	√2 a ² (cm ²) ^②
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考え方
/ 6

問9

(1)	中央の自然数 x + 1 [△]	(2)	最も大きい自然数 x + 2 [△]
(2)	x(x + 2) = 5(x + 1) - 1 ^②	(3)	4, 5, 6 ^②

考え方
/ 6

問10.

(1)	6√5 > 4√10 ^③			
(2)	(ア) 14 + 4√10 ^②	(イ) > ^②	(ウ) > ^②	(エ) > ^②
(3)	√13 + √2 < 3 + √6 < √7 + 2√2 ^②			

考え方
/ 13

知識理解	技能	考え方
/ 25	/ 38	/ 39
/ 100		

中3数学 前期期末試験対策①

問1 (1) (ア) $x^2 - 3x + 4 = 0$ ○ (イ) $(x+2)(x-3) = x^2 - x - 6$ X
 (イ) $x^2 - 3x = x^2 + 5$ X

$$\begin{pmatrix} x^2 - 3x - x^2 - 5 = 0 \\ -3x - 5 = 0 \text{ (1次方程式)} \end{pmatrix} \begin{pmatrix} x^2 - x - 6 - x^2 = 0 \\ -x - 6 = 0 \text{ (1次方程式)} \end{pmatrix}$$

 (I) $x^2 - 6 = 0$ ○

(2) $x^2 + x - 2 = 0$
 $(x-1)(x+2) = 0$
 $x = 1, -2$
 (3) $17 \times 23 \dots$ ア $b^2 - 4ac = 0$
 $27 \times 29 \dots$ イ $b^2 - 4ac > 0$
 $(\rightarrow b^2 - 4ac < 0$ なきは 解なし)

(4) (ア) ± 9 (イ) ± 7 (ロ) ± 5 (リ) ± 5

(5) 有理数 $\dots -0.1, \sqrt{64}, \frac{1}{3}$ 無理数 $\dots \sqrt{2}, -\frac{\sqrt{2}}{5}, \pi$

(6) $0 \times \sqrt{2} = 0$
 有理数 $\times$ 無理数 = 有理数

問2 (1) $6 - (-5) = 6 + 5 = 11$
 (2) $7 \times (-2) = -14$
 (3) $\frac{1}{3} - \frac{2}{5} = \frac{5}{15} - \frac{6}{15} = -\frac{1}{15}$
 (4) $25a^3b^2 \div 5a^2b = 5ab$

問3 (1) $\begin{cases} 4x + 3y = 6 \dots \text{①} \\ 2x - y = 8 \dots \text{②} \end{cases}$

① $\times 3$
 $4x + 3y = 6$
 $+ 6x - 3y = 24$
 $10x = 30$
 $x = 3$

② $\times 3$ ①に入
 $2x - y = 8$
 $6 - 8 = y$
 $y = -2$

$\begin{cases} x = 3 \\ y = -2 \end{cases}$

(2) ① $a > 0, b > 0$ のとき
 (イ) $y = \frac{1}{2}x + 2$
 ② $a < 0, b < 0$ のとき
 (I) $y = -x - 2$

(3) (a) $\frac{1}{6}$
 (b) $\frac{3}{6} = \frac{1}{2}$

問4

(1) $5\sqrt{3} - 2\sqrt{3} = 3\sqrt{3}$ (2) $\sqrt{2} \times \sqrt{3} = \sqrt{6}$ (3) $\frac{20}{\sqrt{5}} = \sqrt{20}$
 $= \frac{20\sqrt{5}}{5} = 4\sqrt{5}$
 $= 6\sqrt{5} - 2\sqrt{5}$
 $= 4\sqrt{5}$
 (3) $\sqrt{4} + (\sqrt{3} + \sqrt{2})(\sqrt{3} - 3\sqrt{2})$
 $= 2\sqrt{6} + 3 - 2\sqrt{5} \times \sqrt{3} - 3 \times 2$
 $= 2\sqrt{6} + 3 - 2\sqrt{6} - 6$
 $= -3$

問5

(1) $x^2 = 3$ (2) $x(x-5) = 0$ (3) $x^2 + 9x - 14 = 0$
 $x = \pm\sqrt{3}$ $x = 0, 5$ $(x+2)(x+7) = 0$
 $x = -2, -7$

(4) $x^2 + 3x - 5 = 0$ (5) $x^2 - 6x - 1 = 0$ (解の公式)
 $x = \frac{-3 \pm \sqrt{3^2 - 4 \times 1 \times (-5)}}{2}$ $x^2 - 6x = 1$ $x = \frac{6 \pm \sqrt{6^2 - 4 \times 1 \times (-1)}}{2}$
 $x = \frac{-3 \pm \sqrt{29}}{2}$ $x^2 - 6x + 3^2 = 1 + 3^2$ $x = \frac{6 \pm \sqrt{36 + 4}}{2}$
 $(x-3)^2 = 10$ $x - 3 = \pm\sqrt{10}$ $x = \frac{6 \pm \sqrt{40}}{2}$
 $x = 3 \pm \sqrt{10}$ $x = \frac{6 \pm 2\sqrt{10}}{2}$
 $x = 3 \pm \sqrt{10}$

(6) $2x^2 - 14x - 16 = 0$
 $x^2 - 7x - 8 = 0$
 $(x+1)(x-8) = 0$
 $x = -1, 8$

(7) $\frac{(x+3)^2}{2} = 3x^2 - 2x + 7$ (両辺 $\times 2$)
 $(x+3)^2 = 6x^2 - 4x + 14$ (展開)
 $x^2 + 6x + 9 = 6x^2 - 4x + 14$ (両辺 $-6x - 9$)
 $-5x^2 + 10x - 5 = 0$ (両辺 $\div (-5)$)
 $x^2 - 2x + 1 = 0$ (因数分解)
 $(x-1)^2 = 0$
 $x = 1$

問6

$$(1) \sqrt{8n} = \sqrt{2^3 n} = \sqrt{2^2 \times 2 \times n} \quad n=2$$

$$(2) \sqrt{\frac{175n}{3}} = \sqrt{\frac{5^2 \times 7 \times n}{3}} \quad n=7 \times 3 = 21$$

$$(3) \sqrt{25-n^2} \text{ が自然数となる整数 } n \text{ について}$$

∴ 値が 0 以上

25以下の2乗の数 → 25, 16, 9, 4, 1

$25-n^2=25$	$25-n^2=16$	$25-n^2=9$	$25-n^2=4$	$25-n^2=1$
$n^2=0$	$n^2=25-16$	$n^2=25-9$	$n^2=25-4$	$n^2=25-1$
$n=0$	$n^2=9$	$n^2=16$	$n^2=21$	$n^2=24$
	$n=\pm 3$	$n=\pm 4$	$n=\pm \sqrt{21}$	$n=\pm \sqrt{24}$
			$n=\pm 2\sqrt{3}$	$n=\pm 2\sqrt{6}$

1, 12, ±3, ±4

$$(4) x = \sqrt{5} + \sqrt{3}, y = \sqrt{5} - \sqrt{3} \text{ なら } x^2 - y^2 \text{ の値}$$

$$\begin{aligned} x^2 - y^2 &= (x+y)(x-y) \quad \leftarrow \text{代入} \\ &= (\sqrt{5} + \sqrt{3} + \sqrt{5} - \sqrt{3}) \{ \sqrt{5} + \sqrt{3} - (\sqrt{5} - \sqrt{3}) \} \\ &= 2\sqrt{5} \times (\sqrt{5} + \sqrt{3} - \sqrt{5} + \sqrt{3}) \\ &= 2\sqrt{5} \times 2\sqrt{3} \\ &= 4\sqrt{15} \end{aligned}$$

$$(5) x = 3 + \sqrt{10}, y = 3 - \sqrt{10} \text{ なら } x^2 y^2 - x^2 y^5 \text{ の値}$$

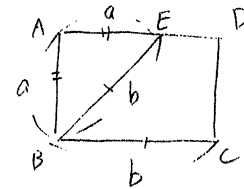
$$\begin{cases} x+y = 3+\sqrt{10}+3-\sqrt{10} = 6 \\ xy = (3+\sqrt{10})(3-\sqrt{10}) = 9-10 = -1 \end{cases}$$

$$\begin{aligned} x^2 y^2 - x^2 y^5 &= x^2 y^2 (x^3 - x y^3) \\ &= (xy)^2 \{ x^2 - (xy) y^2 \} \\ &= (-1)^2 \{ x^2 - (-1) y^2 \} \\ &= x^2 + y^2 \\ &= (x+y)^2 - 2xy \\ &= 6^2 - 2(-1) \\ &= 38 \end{aligned}$$

問7 $0.45 = x$ とする

$$\begin{aligned} 100x &= 45.45 \\ -) \quad x &= 0.45 \\ \hline 99x &= 45 \\ x &= \frac{45}{99} \\ x &= \frac{5}{11} \end{aligned}$$

問8



$$(1) b = \sqrt{2} a \quad \leftarrow (b \text{ は } 1 \text{ 辺 } a \text{ の正切の対角線だから})$$

$$\begin{aligned} (2) b &= \sqrt{5} \times 15 = 1.41 \times 15 = 21.15 \approx 21.2 \text{ m} \\ (3) 2: a b &= a \times \sqrt{5} a = \sqrt{5} a^2 \text{ cm}^2 \end{aligned}$$

問9

$$(1) \text{ 最も小の自然数 } x \text{ とすると}$$

中央の数 $x+1$, 最大の数 $x+2$

$$(2) (x+2)x = 5(x+1) - 1$$

↑ 最大数 ↑ 最小数 ↑ 中央数

$$\begin{aligned} (3) x^2 + 2x &= 5x + 5 - 1 \\ x^2 + 2x &= 5x + 4 \\ x^2 + 2x - 5x - 4 &= 0 \\ x^2 - 3x - 4 &= 0 \\ (x-4)(x+1) &= 0 \\ x &= -1, 4 \end{aligned}$$

∴ 自然数だから $x=4$

問10

$$(1) 8\sqrt{5} \quad 4\sqrt{10}$$

2乗 ↓

$$\begin{aligned} 180 &> 160 \\ 8\sqrt{5} &> 4\sqrt{10} \\ (1) (7) (2+\sqrt{10})^2 &= 4 + 4\sqrt{10} + 10 \\ &= 14 + 4\sqrt{10} \end{aligned}$$

$$\text{問10 (3)} (3+\sqrt{8})^2 = 9+6\sqrt{8}+8 = 15+6\sqrt{8}$$

$$(\sqrt{7}+\sqrt{5})^2 = 7+4\sqrt{35}+5 = 12+4\sqrt{35}$$

$$(\sqrt{13}+\sqrt{5})^2 = 13+2\sqrt{65}+5 = 18+2\sqrt{65}$$

$$\begin{aligned} (6\sqrt{8})^2 &= 216 & (4\sqrt{14})^2 &= 224 & (2\sqrt{35})^2 &= 140 \end{aligned}$$

$$\sqrt{13} + \sqrt{2} < 3 + \sqrt{8} < \sqrt{7} + 2\sqrt{2}$$