

問 1

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

※1点 (有理数) ※1点 (無理数) ※1点 (計算)

知識

/ 25

技能

/ 8

問 2

(1)	11	(2)	28	(3)	$-\frac{1}{15}$	(4)	56
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問 3

(1)	$x = 3$	(2)	① 1	② I
	$y = -2$			
(3)	(a)	$\frac{1}{8}$	(b)	$\frac{1}{2}$

技能

/ 6

問 4

(1)	$3\sqrt{3}$	(2)	$\sqrt{6}$
(3)	$4\sqrt{5}$	(4)	-3

技能

/ 8

問 5

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

技能

/ 14

問 6

(1)	$n = 2$	(2)	$n = 21$	(3)	$n = 0, \pm 3, \pm 4$
(4)	$4\sqrt{15}$	(5)	38		

考え方

/ 10

問 7

0.45 = x とする

$100x = 45.45$

$\rightarrow x = 0.45$

$99x = 45$

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

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

※1点

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

考え方

/ 4

問 8

(1)	$b = \sqrt{2}a$	(2)	$b = 21.2$	(3)	$\sqrt{2}a^2 \text{ (cm}^2\text{)}$
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考え方

/ 6

問 9

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

考え方

/ 6

問 10

(1)	$6\sqrt{5} > 4\sqrt{10}$						
(2)	(ア) $14 + 4\sqrt{10}$	(イ)	$>$	(ウ)	$>$	(エ)	$>$
(3)	$\sqrt{13} + \sqrt{2} < 3 + \sqrt{6} < \sqrt{7} + 2\sqrt{2}$						

考え方

/ 13

知識理解	技能	考え方
/ 25	/ 36	/ 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
 (イ) $x^2 - 3x = x^2 + 5$ X

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

(2) $x^2 + x - 2 = 0$ (3) 17に73...ア $b^2 - 4ac = 0$
 $(x-1)(x+2) = 0$ 27に73...イ $b^2 - 4ac > 0$
 $x = 1, -2$ (エ $b^2 - 4ac < 0$ な6に73 解なし)

(4) (a) ± 9 (b) ± 7 (c) ± 5 (d) ± 5

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

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

問2 (1) $6 - (-5)$ (2) $7 \times (-2)^2$ (3) $\frac{1}{3} - \frac{2}{5} \times 3$ (4) $25a^3b^2 \div 5a^3b$
 $= 6 - (-5)$ $= 7 \times 4$ $= \frac{5}{15} - \frac{6}{15}$ $= \frac{5a^3b^2 \times 6^2}{5a^3b}$
 $= 11$ $= 28$ $= -\frac{1}{15}$ $= 5b$

問3 (1) $\begin{cases} 4x + 3y = 6 \dots \text{①} \\ 2x - y = 8 \dots \text{②} \end{cases}$ (2) ① $a > 0, b > 0$ のとき
 ① + ② $\times 3$ ②に $x=3$ を代入 (イ) $y = \frac{1}{2}x + 2$
 $4x + 3y = 6$ $2 \times 3 - y = 8$ ② $a < 0, b < 0$ のとき
 $+) 6x - 3y = 24$ $6 - 8 = y$ (エ) $y = -x - 2$
 $10x = 30$ $y = -2$ (3) (a) $\frac{1}{6}$
 $x = 3$ $\begin{cases} x = 3 \\ y = -2 \end{cases}$ (b) $\frac{3}{6} = \frac{1}{2}$

RE] 4

$$(1) 5\sqrt{3} - 2\sqrt{3} = 3\sqrt{3}$$

$$(2) \sqrt{2} \times \sqrt{3} = \sqrt{6}$$

$$(3) \frac{30}{\sqrt{5}} = \sqrt{20}$$

$$= \frac{30\sqrt{5}}{5} = 2\sqrt{5}$$

$$(3) \sqrt{24} + (\sqrt{3} + \sqrt{2})(\sqrt{3} - 3\sqrt{2})$$

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

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

$$= -3$$

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

$$= 4\sqrt{5}$$

PE] 5

$$(1) x^2 = 3$$

$$x = \pm\sqrt{3}$$

$$(2) x(x-5) = 0$$

$$x = 0, 5$$

$$(3) x^2 + 9x - 14 = 0$$

$$(x+14)(x-1) = 0$$

$$x = -14, -1$$

$$(4) x^2 + 3x - 5 = 0$$

$$x = \frac{-3 \pm \sqrt{3^2 - 4 \times 1 \times (-5)}}{2}$$

$$x = \frac{-3 \pm \sqrt{29}}{2}$$

$$(5) x^2 - 6x - 1 = 0$$

$$x^2 - 6x = 1$$

$$x^2 - 6x + 3^2 = 1 + 3^2$$

$$(x-3)^2 = 10$$

$$x-3 = \pm\sqrt{10}$$

$$x = 3 \pm \sqrt{10}$$

(解公式)

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

$$x = \frac{6 \pm \sqrt{36+4}}{2}$$

$$x = \frac{6 \pm \sqrt{40}}{2}$$

$$x = \frac{3 \pm 2\sqrt{10}}{1}$$

$$(6) 2x^2 - 14x - 16 = 0$$

$$x^2 - 7x - 8 = 0$$

$$(x+1)(x-8) = 0$$

$$x = -1, 8$$

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

$$(x+3)^2 = 6x^2 - 4x + 14$$

$$x^2 + 6x + 9 = 6x^2 - 4x + 14$$

$$-5x^2 + 10x - 5 = 0$$

$$x^2 - 2x + 1 = 0$$

$$(x-1)^2 = 0$$

$$x = 1$$

十字相法!!

两边 $\times 2$

移项 以 x^2 为基准

同项移项

两边 $\div (-5)$

因式分解

問 6

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

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

← 7と21に約分
↑ 分母の3を約分で消すため

$$(3) \sqrt{25 - n^2} \text{ が自然数となる整数 } n \text{ の下から}$$

↑ 0 値は 0 は OK
↑ 0 以下も負の数でも OK!!

25 以下の 2 乗の数 → 25, 16, 9, 4, 1

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

1, 0, ±3, ±4

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

$$\begin{aligned} x^2 - y^2 &= (x+y)(x-y) \quad \leftarrow \text{代入} \\ &= (\sqrt{5} + \sqrt{3} + \sqrt{5} - \sqrt{3}) \{ \sqrt{5} + \sqrt{3} - (\sqrt{5} - \sqrt{3}) \} \\ &= 2\sqrt{5} \times (\sqrt{5} + \sqrt{3} - \sqrt{5} + \sqrt{3}) \\ &\quad \leftarrow \text{ここから計算!!} \\ &= 2\sqrt{5} \times 2\sqrt{3} \end{aligned}$$

$$= 4\sqrt{15}$$

$$(5) x = 3 + \sqrt{10}, y = 3 - \sqrt{10} \text{ において } x^4 y^2 - x^3 y^5 \text{ の値}$$

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

$$\begin{aligned} x^4 y^2 - x^3 y^5 &= x^3 y^2 (x - xy^3) \\ &= (xy)^3 \{ x^2 - (xy)y^2 \} \\ &= (-1)^3 \{ x^2 - (-1)y^2 \} \quad \leftarrow \text{代入} \\ &= -1 \{ x^2 + y^2 \} \\ &= -(x^2 + y^2) \quad \leftarrow \text{例のやつで割る} \\ &= -(x-y)^2 - 2xy \\ &= 6^2 - 2 \times (-1) \\ &= 38 \end{aligned}$$

問7 $0.45 = x$ とする

$$100x = 45.45$$

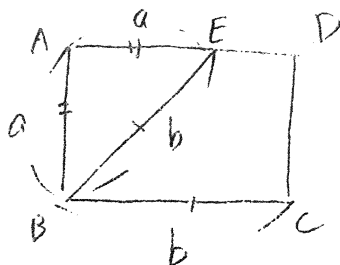
$$\begin{array}{r} -) \quad x = 0.45 \\ \hline \end{array}$$

$$99x = 45$$

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

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

問8



(1) $b = \sqrt{2} a$ $\left(\begin{array}{l} b \text{ は } 1 \text{ 辺 } a \text{ の正方形の} \\ \text{対角線の長さ} \end{array} \right)$

(2) $b = \sqrt{2} \times 15$

(3) $S: ab$

$$= 1.41 \times 15$$

$$= 21.15$$

$$\approx 21.2 \text{ m}$$

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

$$= \sqrt{2} a^2 \text{ m}^2$$

問9

(1) 最も小さい自然数を x とすると

中央の数 $x+1$, 最も大きい数 $x+2$

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

↑ ↑ ↑
最も小さい数 最も大きい数 中央の数

(3) $x^2 + 2x = 5x + 5 - 1$ x は自然数だから

$$x^2 + 2x = 5x + 4$$

$$x = 4$$

$$x^2 + 2x - 5x - 4 = 0$$

$$x^2 - 3x - 4 = 0$$

$$(x+1)(x-4) = 0$$

$$x = -1, 4$$

A 4, 5, 6

問10

(1) $6\sqrt{5}$ $4\sqrt{10}$

2乗 ↓

$$180 > 160$$

∴

$$6\sqrt{5} > 4\sqrt{10}$$

(2) (3) $(2+\sqrt{10})^2$

$$= 4 + 4\sqrt{10} + 10$$

$$= 14 + 4\sqrt{10}$$

(1) >

(2) >

(3) >

$\left(\begin{array}{l} \text{負の数同士は比較} \\ \text{できない} \end{array} \right)$

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

$$(\sqrt{7} + 2\sqrt{2})^2 = 7 + 4\sqrt{14} + 8 = 15 + 4\sqrt{14}$$

$$(\sqrt{13} + \sqrt{2})^2 = 13 + 2\sqrt{26} + 2 = 15 + 2\sqrt{26}$$

線部を比較して

$$(6\sqrt{6})^2 = 216 \quad (4\sqrt{14})^2 = 224 \quad (2\sqrt{26})^2 = 104$$

$$\sqrt{13} + \sqrt{2} < 3 + \sqrt{6} < \sqrt{7} + 2\sqrt{2}$$