中3数学　前期期末試験対策②　氏名

1

1	8	2	$-\frac{3}{8}$	3	$9a$	4	$4x+17$

1. 各3点　/12

2

1	$m(m-n+5)$	2	$(y-9)^2$
3	$(x+2)(x-9)$	4	$4(x+3)(x-3)$
5	$-0.1xy(x+3y)(x-5y)$		

2　各3点　/15

3

1	12	2	$7\sqrt{2}$	3	$10\sqrt{3}$
4	5	5	$\sqrt{6}$		

3　各3点　/15

4

1	$x=2, 4$	2	$x=0, -\frac{1}{3}$	3	$x=\pm 9$
4	$x=2$	5	$x=1\pm 3\sqrt{3}$	5	$x=-1, -4$
7	$x=2, -7$				

4　各3点　/21

5

1	$n=6$	2	12	3	10		
4	$1-\sqrt{5}$	5	1辺	$\sqrt{34}$ cm	対角線	$2\sqrt{17}$ cm	
6	$11, 12, 13$						

5　各3点　/21

6

1	$2^5\times 3$	3	$a=7, 8, 13$

2
$12^2+10^2-11^2-9^2$
$=12^2-11^2+10^2-9^2$
$=(12+11)(12-11)+(10+9)(10-9)$
$=23\times 1+19\times 1$
$=23+19$
$=42$

6　各2点　/6

7

ア	①	69	②	$10a+b$	③	$9a$	
④	9	⑤	あまり	イ	$A=7$		

7　各1点　/6

8

a	$a=8$	他の解	$x=-3$

8　各2点　/4

9

1	$x=\sqrt{6}$	2	18000円

9　各3点　/6

10

1	$x=\sqrt{2}$	2	$\frac{\sqrt{2}}{2}$ 倍

10　各2点　/4

11

ア	①	$11+6\sqrt{2}$			②	$11+4\sqrt{7}$	
③	$<$	④	$<$	⑤	$<$		
イ	$\sqrt{3}+\sqrt{11} < 3+\sqrt{5} < \sqrt{6}+2\sqrt{2}$						

中3数学　前期期末対策②

1 (1) $-5+13=8$ ③

(2) $\frac{1}{8}-\frac{1}{2}$
$=\frac{1}{8}-\frac{4}{8}$
$=-\frac{3}{8}$ ③

(3) $27a^2b \div 3ab$
$=\frac{9\times 3\times a\times a\times b}{3\times a\times b}$
$=9a$ ③

(4) $(x-1)^2-(x+2)(x-8)$
$=x^2-2x+1-(x^2-6x-16)$
$=x^2-2x+1-x^2+6x+16$
$=4x+17$ ③

2 (1) $m^2-mn+5n$
$=m(m-n+5)$ ③

(2) $y^2-18y+81$
$=(y-9)^2$ ②

(3) $(x-6)(x+3)-4x$
$=x^2-3x-18-4x$
$=x^2-7x-18$
$=(x+2)(x-9)$ ③

(4) $4x^2-36$ ← 打ち消し因数でくくる!!!
$=4(x^2-9)$
$=4(x+3)(x-3)$ ③

(5) $1.5xy^3+0.2x^2y^2-0.1x^3y$
$=0.1(15xy^3+2x^2y^2-x^3y)$
$=0.1xy(15y^2+2xy-x^2)$
$=-0.1xy(x^2-2xy-15y^2)$
$=-0.1xy(x+3y)(x-5y)$ ③

3 (1) $\sqrt{24}\times\sqrt{8}$
$=2\sqrt{6}\times\sqrt{6}$
$=12$ ③

(2) $3\sqrt{5}+4\sqrt{2}$
$=7\sqrt{2}$ ③

(3) $8\sqrt{3}-\frac{6}{\sqrt{3}}+\sqrt{48}$ (×√3)
$=8\sqrt{3}-\frac{6\sqrt{3}}{3}+4\sqrt{3}$
$=8\sqrt{3}-2\sqrt{3}+4\sqrt{3}$
$=10\sqrt{3}$ ③

(4) $(3+\sqrt{5})^2-6(3+\sqrt{5})+9$
$=9+6\sqrt{5}+5-18-6\sqrt{5}+9$
$=5$ ③

(5) $\sqrt{18}\div 2\sqrt{5}\times\sqrt{60}-\frac{3\sqrt{8}}{\sqrt{3}}$
$=\frac{3\sqrt{2}\times\sqrt{3}\times\sqrt{3}}{2\sqrt{5}}-\frac{6\sqrt{2}\times\sqrt{3}}{\sqrt{3}\times\sqrt{3}}$
$=3\sqrt{6}-\frac{6\sqrt{6}}{3}$
$=\sqrt{6}$ ③

4 (1) $x^2-6x+8=0$
$(x-2)(x-4)=0$
$x=2,\ 4$ ③

(2) $3x^2+x=0$
$x(3x+1)=0$
$x=0,\ -\frac{1}{3}$ ③
(3x+1=0, 3x=-1, x=-1/3)

(3) $x^2-81=0$
$(x+9)(x-9)=0$
$x=\pm 9$ ③

(4) $5x^2-20x=-20$
$5x^2-20x+20=0$
$x^2-4x+4=0$
$(x-2)^2=0$
$x=2$ ③

(5) $(x-1)^2=27$
$x-1=\pm\sqrt{27}$
$x=1\pm 3\sqrt{3}$ ③

(6) $(2x+5)^2-9=0$
$(2x+5)^2=9$
$2x+5=\pm 3$
$2x=-5\pm 3$
$2x=-2,\ -8$
$x=-1,\ -4$ ③

〈別解〉
(6) $4x^2+20x+25-9=0$
$4x^2+20x+16=0$
$x^2+5x+4=0$
$(x+1)(x+4)=0$
$x=-1,\ -4$

(7) $2(x+2)(x-2)-3x+10=(x-4)^2$
$2(x^2-4)-3x+10=x^2-8x+16$
$2x^2-8-3x+10-x^2+8x-16=0$
$x^2+5x-14=0$
$(x-2)(x+7)=0$
$x=2,\ -7$ ③

5 (1) $\sqrt{24n}$　$24=2^3\times 3$
$=2^2\times 2^0\times 3^9$
$n=3\times 3=6$ ③

(2) $x=\sqrt{3}+2$, $y=\sqrt{3}-2$ のとき
$x^2+2xy+y^2$
$=(x+y)^2$ ←ナイス
$=(\sqrt{3}+2+\sqrt{3}-2)^2$
$=(2\sqrt{3})^2$
$=12$ ③

(3) $a+b=2\sqrt{5}$, $ab=5$ のとき
$a^2+b^2=(a+b)^2-2ab$ ←ナイス
$=(2\sqrt{5})^2-2\times 5$
$=20-10$

(4) $4 < 5 < 9$

$2 < \sqrt{5} < 3$

$a = \sqrt{5} - 2$

$\frac{a-3}{a+2} = \frac{\sqrt{5}-2-3}{\sqrt{5}-2+2}$

$= \frac{\sqrt{5}-5}{\sqrt{5}}$ ×$\sqrt{5}$ ×$\sqrt{5}$

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

$= \frac{5-5\sqrt{5}}{5}$ ← 3つで約分!

$= 1-\sqrt{5}$ ③

(5) 1辺3cm → $3^2 = 9$ cm²

1辺5cm → $5^2 = 25$ cm²

$9+25 = 34$ cm² の正方形

↓ 1辺

$\sqrt{34}$ cm ③

対角線

$\sqrt{34} \times \sqrt{2} = 2\sqrt{17}$ cm ③

(1) 連続する3つ自然数の真ん中を n とする　3つの数は $n-1$, n, $n+1$

3つの和は $\sqrt{n-1+n+n+1} = \sqrt{3n}$ ← $3n$ が2乗の数になればよい

$n_1 = 3$ → 2, 3, 4 (例1)

$n_2 = 3 \times 2^2 = 12$ → 11, 12, 13 ③

$n_3 = 3 \times 3^2 = 27$ → 26, 27, 28

$n_4 = 3 \times 4^2 = 48$ → 47, 48, 49

6 (1) $96 = 2^5 \times 3$ ②

(2) $12^2 + 10^2 - 11^2 - 9^2$

$= 12^2 - 11^2 + 10^2 - 9^2$

$= (12+11)(12-11) + (10+9)(10-9)$

$= 23 \times 1 + 19 \times 1$

$= 23 + 19$

$= 42$ ②

(3) $x^2 + ax + 12$　自然数だから正の数

積が12

$1+12 = 13$

$2+6 = 8$

$3+4 = 7$

A a: 7, 8, 13 ②

7 (ア) ① 69 (1) ② $10a+b$ (1) ③ $9a$ (1) ④ 9 (1) ⑤ あまり (1)

(イ) $79 \div 9 = 8 \cdots 7$　A = 7 ①

8 $x^2 + ax + 15 = 0$ に $x = -5$ を代入

$25 - 5a + 15 = 0$

$5a = 40$

$a = 8$

a: 8を代入

$x^2 + 8x + 15 = 0$

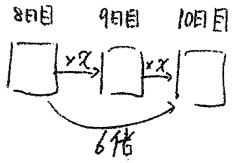
$(x+3)(x+5) = 0$

$x = -3, -5$

他

$\begin{cases} a = 8 & ② \\ \text{他の解 } x = -3 & ② \end{cases}$

9 (1)

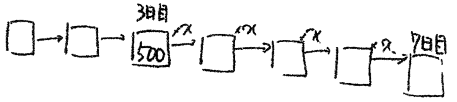


$x^2 = 6$

$x = \pm\sqrt{6}$

$x = \sqrt{6}$ ③

(2)



$500 \times x^4$

$= 500 \times (x^2)^2$

$= 500 \times 6^2$

$= 500 \times 36$

$= 18000$ 円 ③

10 (1) $x = \sqrt{2}$ ②

(2) 面積が $\frac{1}{5}$ → 1辺 $\sqrt{\frac{1}{5}}$ 倍

$= \frac{\sqrt{1}}{\sqrt{5}}$ 倍

$= \frac{\sqrt{5}}{5}$ 倍 ②

(補) 面積が a 倍 → 1辺は $\sqrt{a}$ 倍

例 3倍 → 1辺は $\sqrt{3}$ 倍

11 (ア) ① $(3+\sqrt{2})^2 = 9 + 6\sqrt{2} + 2$

$= 11 + 6\sqrt{2}$

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

$= 11 + 4\sqrt{7}$

③ $(6\sqrt{2})^2 = 72$　$(4\sqrt{7})^2 = 16 \times 7$

$= 112$

$6\sqrt{2} < 4\sqrt{7}$

④ $(3+\sqrt{2})^2 < (2+\sqrt{7})^2$

⑤ $3+\sqrt{2} < 2+\sqrt{7}$

(イ) $(3+\sqrt{2})^2 = 14 + 6\sqrt{2}$,　$(\sqrt{8}+2\sqrt{2})^2 = 14 + 8\sqrt{2}$,　$(\sqrt{3}+\sqrt{11})^2 = 14 + 2\sqrt{33}$

$(6\sqrt{2})^2 = 180$, $(8\sqrt{2})^2 = 192$, $(2\sqrt{33})^2 = 132$ より

$\sqrt{3}+\sqrt{11} < 3+\sqrt{5} < \sqrt{8}+2\sqrt{2}$ となる