H28産技①

1 (1)

$$-\frac{1}{3}+\frac{11}{12}-\frac{1}{18}\div\frac{2}{9}$$

$$=-\frac{4}{12}+\frac{11}{12}-\frac{1}{18}\times\frac{9}{2}$$

$$=-\frac{4}{12}+\frac{11}{12}-\frac{3}{12}$$

$$=\frac{4}{12}$$

$$=\frac{1}{3}$$

(2)

$$(\sqrt{5}+2)^2-(\sqrt{5}+1)^2$$

$$=5+4\sqrt{5}+4-(5+2\sqrt{5}+1)$$

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

(3)

$$(-8a)^2\div16a^3\times\frac{1}{2}a^2$$

$$=\frac{64a^2}{1}\times\frac{1}{16a^3}\times\frac{a^2}{2}$$

$$=2a$$

(4)

$$3a-2b-\frac{5a-3b}{3}$$

$$=\frac{3(3a-2b)-(5a-3b)}{3}$$

$$=\frac{9a-6b-5a+3b}{3}$$

$$=\frac{4a-3b}{3}$$

H28産技②

Ⅱ (5) $x(y-6)-y+6$

$=x(y-6)-(y-6)$

$=\underline{(x-1)(y-6)}$ //

(6) $(x-1)^2+4(x-1)-2=0$

$(x-1)^2+4(x-1)+4=2+4$

$\{(x-1)+2\}^2=6$

$x+1=\pm\sqrt{6}$

$\therefore \underline{x=-1\pm\sqrt{6}}$ //

(7) $1.5<\sqrt{n}<2.5$

$(1.5)^2<n<(2.5)^2$

$2.25<n<6.25$

$\therefore$ <u>4個</u> // $(n=3,4,5,6)$

H28産技③

$\boxed{2}$ (1)
$$\begin{cases} x + y = 50 \\ \dfrac{8}{100}x + \dfrac{3}{100}y = 50 \times \dfrac{5}{100} \end{cases}$$

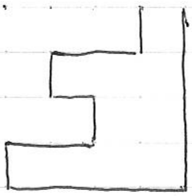
$$\begin{cases} 8x + 8y = 400 \\ 8x + 3y = 250 \end{cases}$$
$$5y = 150$$
$\therefore y = 30$

$x + 30 = 50$

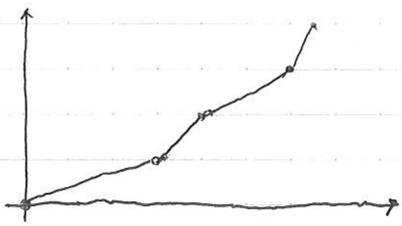
$\therefore x = 20$

$\therefore \underline{x = 20,\ y = 30}$ //

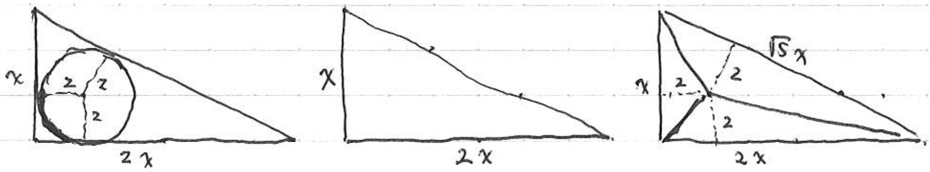
(2)



底面積が大きくなると
水位は増えにくくなる。
∴ ウ //



(3)



$\sqrt{(2x)^2 + x^2} = \sqrt{5}x$

直角三角形の面積の関係より

$2x \times x \div 2 = 2x \times 2 \div 2 + x \times 2 \div 2$
$\quad + \sqrt{5}x \times 2 \div 2$

$x^2 = 2x + x + \sqrt{5}x$

$x^2 = 3x + \sqrt{5}x$

$\therefore x = 3 + \sqrt{5}$ ($\because x > 0$)

$\sqrt{5}x = \sqrt{5}(3 + \sqrt{5})$

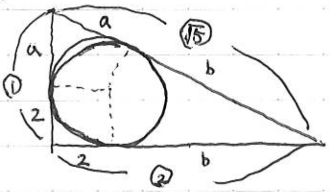
$= \underline{(3\sqrt{5} + 5)\text{cm}}$ //

No.

Date

H28 産技④

② (3) 別解



$$\sqrt{1^2+2^2}=\sqrt{5}$$

$$\begin{cases} a+2=x & \therefore a=x-2 \\ b+2=2x & \therefore b=2x-2 \\ a+b=\sqrt{5}\,x \end{cases}$$

$$(x-2)+(2x-2)=\sqrt{5}\,x$$

$$(3-\sqrt{5})x=4$$

$$\therefore x=\frac{4}{3-\sqrt{5}}$$

$$=\frac{4(3+\sqrt{5})}{(3-\sqrt{5})(3+\sqrt{5})}$$

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

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

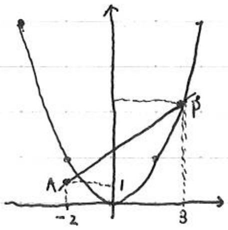
$$=\underline{3+\sqrt{5}}\ /\!/$$

(4) 0、0、1、1、3、
7、6、5、5、5

$(3+5)\div 2=\underline{4}\ /\!/$

H28産技⑤

$\boxed{3}$ (1)



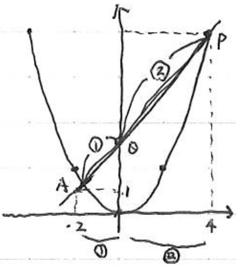
$3^2 = 9$

$A(-2,\ 1)$

$P(3,\ 9)$

$\therefore\ y = \dfrac{8}{5}x + \dfrac{21}{5}$ //

(2)



$4^2 = 16$

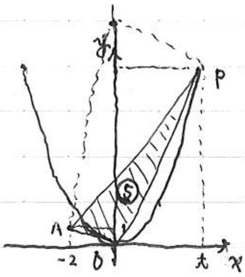
$A(-2,\ 1)$

$P(4,\ 16)$

$\therefore\ y = \dfrac{5}{2}x + 6$

$\therefore\ Q(0,\ 6)$ //

(3)



y軸上に$R(0,\ y)$をとると、

$\triangle OAR$の面積が$5\,cm^2$となるとき

$y \times 2 \div 2 = 5$

$\therefore\ y = 5$

ここで、OAの傾きは$-\frac{1}{2}$であるから

点Rを通りOAに平行な直線の式は

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

これと$y = x^2$の交点は

$x^2 = -\frac{1}{2}x + 5$

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

$$\therefore\ x = \frac{-1 \pm \sqrt{1^2 - 4 \times 2 \times (-10)}}{2 \times 2}$$

$$= \frac{-1 \pm 9}{4}$$

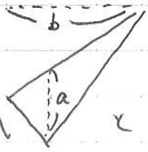
$$= 2,\ -\frac{5}{2}$$

$t > 0$より

$t = 2$ //

($Q\left(0,\ \dfrac{2t^2 + t}{t + 2}\right)$

となるので、

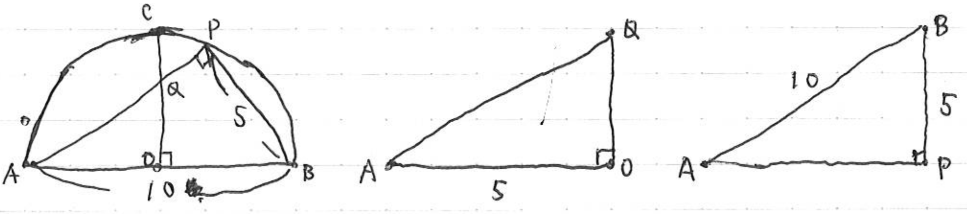


$S = \dfrac{ab}{2}$

としてもよい。)

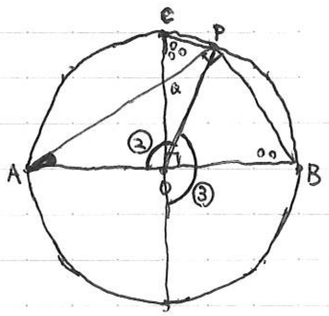
H28座技⑥

4 (1)



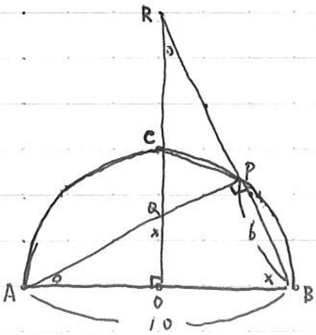
$$AP = \sqrt{10^2 - 5^2}$$
$$= 5\sqrt{3}$$
$$AQ : 10 = 5 : 5\sqrt{3}$$
$$\therefore AQ = \frac{10}{3}\sqrt{3}$$
$$PQ = 5\sqrt{3} - \frac{10}{3}\sqrt{3}$$
$$= \frac{5}{3}\sqrt{3}\ \text{cm}$$

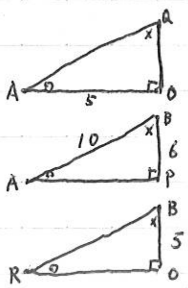
(2)



$$\angle POA = 270° \times \frac{2}{2+3}$$
$$= 108°$$
$$\angle PBA = 108° \div 2$$
$$= 54°$$
$$\angle PAB = 180° - (90° + 54°)$$
$$= 36°$$

(3)



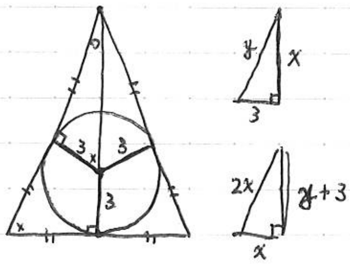


$$AP = \sqrt{10^2 - 6^2} = 8$$
$$OQ = 6 \times \frac{5}{8} = \frac{15}{4}$$
$$OR = 8 \times \frac{5}{6} = \frac{20}{3}$$
$$OQ : QR = \frac{15}{4} : \left(\frac{20}{3} - \frac{15}{4}\right)$$
$$= 9 : 7$$

H28産技⑦

5 (1) $\frac{4}{3}\pi \times 3^3 = \underline{36\pi \text{ cm}^3}$

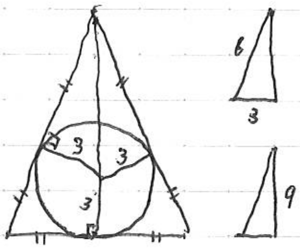
(2)



$3 \times 2 = 6$

$6 + 3 = \underline{9 \text{ cm}}$

(3)

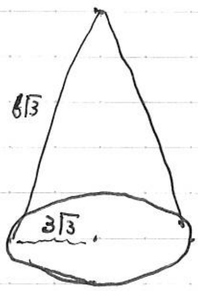


$\sqrt{6^2 - 3^2} = 3\sqrt{3}$

$3 \times \frac{9}{3\sqrt{3}} = 3\sqrt{3}$

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

$3\sqrt{3} \times 6\sqrt{3} \times \pi = \underline{54\pi \text{ cm}^2}$



公 式 集

直線の式

$A(p, q)$, $B(r, s)$ → $q = pa + b$, $s = ra + b$ （a, b を求める） → $y = ax + b$ （代入する）

↓

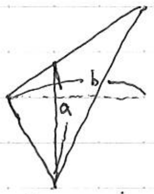
$a = \dfrac{q - s}{p - r}$ （傾きを求める） → $q = pa + b$, $s = ra + b$ （切片を求める）

球の体積

$$V = \frac{4}{3}\pi r^3$$

（身の上に心配あるから参上した）

三角形の面積

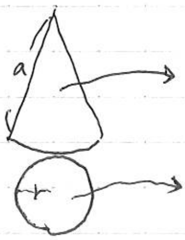


$$S = \frac{1}{2}ab$$

（


$$\begin{aligned} S &= \frac{1}{2}ab_1 + \frac{1}{2}ab_2 \\ &= \frac{1}{2}a(b_1 + b_2) \\ &= \frac{1}{2}ab \end{aligned}$$
）

円すいの表面積



→ $ar\pi$

→ $r^2\pi$

$$S = ar\pi + r^2\pi$$

（


$2r \times a \div 2 = ar\pi$
）