H26 産技①

1 (1) $\frac{8}{21}+\left(1-\frac{5}{7}\right)\times\left(\frac{1}{2}-3\right)$

$=\frac{8}{21}+\frac{2}{7}\times\left(-\frac{5}{2}\right)$

$=\frac{8}{21}-\frac{5}{7}$

$=\frac{8}{21}-\frac{15}{21}$

$=-\frac{7}{21}$

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

(2) $\frac{1}{2}a^2b\times(-3b)^3\div\left(\frac{9}{2}ab^4\right)$

$=\frac{a^2b}{2}\times\frac{-27b^3}{1}\times\frac{2}{9ab^4}$

$=-3a$

(3) $\frac{12a-15b}{3}+3b-4a$

$=\frac{12a-15b}{3}+\frac{3(3b-4a)}{3}$

$=\frac{12a-15b+9b-12a}{3}$

$=\frac{-6b}{3}$

$=-2b$

H26産技②

1 (4) $(x-7)^2-6=(x-7)$

$(x-7)^2-(x-7)-6=0$

$\{(x-7)-3\}\{(x-7)+2\}=0$

$(x-10)(x-5)=0$

$\therefore x=10,\ 5$ //

(5) $(2a+b)^2+2(a-b)^2$

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

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

$=6a^2+3b^2$

$=6\times\left(\frac{1}{\sqrt{2}}\right)^2+3\times\left(\frac{1}{\sqrt{3}}\right)^2$

$=\frac{6}{1}\times\frac{1}{2}+\frac{3}{1}\times\frac{1}{3}$

$=3+1$

$=4$ //

H26産技③

2 (1) $\{(-4)+(-2)\} \times a = 12$

$-6a = 12$

$\therefore a = -2$

(2) $x : (x+6) = 2 : 3$

$2(x+6) = 3x$

$2x + 12 = 3x$

$\therefore x = 12$人

(3) $\left(\frac{1}{40} + \frac{1}{60}\right) \times t = 1$周

$\left(\frac{3}{120} + \frac{2}{120}\right) \times t = 1$

$\frac{5}{120} t = 1$

$\frac{t}{24} = 1$

$\therefore t = 24$秒

(4) $\begin{cases} 2x + 4y = 40 \\ 3x + 5y = 54 \end{cases}$

$\begin{cases} 6x + 12y = 120 \\ 6x + 10y = 108 \end{cases}$

$2y = 12$

$\therefore y = 6$

$3x + 5 \times 6 = 54$

$3x = 54 - 30$

$3x = 24$

$\therefore x = 8$

$\therefore x = 8, y = 6$

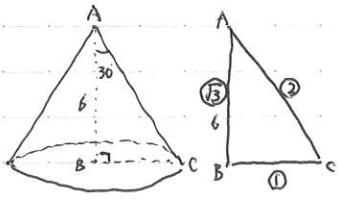
H26産技④

2 (5)

大＼小	1	2	3	4	5	6
1			○			○
2			○			○
3	○	○	○	○	○	○
4			○			○
5			○			○
6	○	○	○	○	○	○

20通り

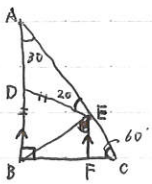
3 (1)



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

$(2\sqrt{3})^2 \pi \times 6 \div 3 =$ 24π cm³

3 (2)

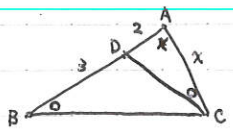


∠BDE = 30° + 20° = 50°

∠DBE = ∠DEB = (180° − 50°) ÷ 2 = 65°

∠DBE = ∠BEF = 65°

4 (1)



△ACD ∽ △ABC

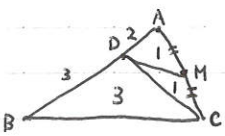
AC : AD = AB : AC

x : 2 = (2 + 3) : x

$x^2 = 10$

∴ $x = \sqrt{10}$ cm

4 (2)



△ADM = △MDC

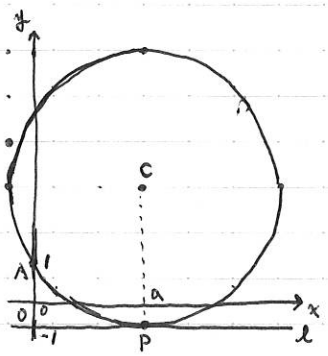
△ACD : △DCB = 2 : 3

△ADM : △ABC = 1 : 5

∴ 5倍

H26 産技⑤

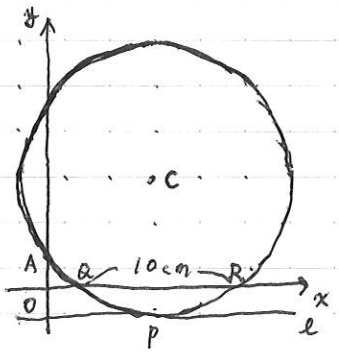
5 (1)



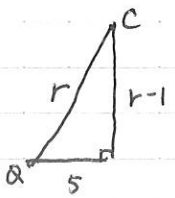
A(0, 1)
P(4, −1)
∴ $y = -\frac{1}{2}x + 1$

(2) 半径を r とすると
C$(a, r-1)$
AC $= r$
$a^2 + \{(r-1) - 1\}^2 = r^2$
$a^2 + r^2 - 4r + 4 = r^2$
∴ $r = 1 + \frac{1}{4}a^2$
∴ $r - 1 = \frac{1}{4}a^2$

(3)



$r^2 = (r-1)^2 + 5^2$
$r^2 = r^2 - 2r + 1 + 25$
∴ $r = 13$ cm

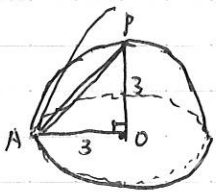


H26 産技⑥

⑥ (1) 半径3cmの半球の体積は

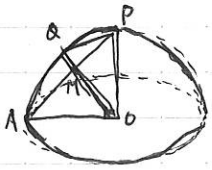
$\frac{4}{3}\pi \times 3^3 \div 2 = 18\pi\ cm^3$

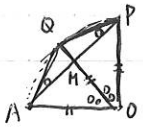
(2)①



$\sqrt{3^2+3^2} = 3\sqrt{2}\ cm$

(2)②





$\angle QOA = 90° \div 2$
$= 45°$

$\overset{\frown}{AQ}$ に対する円周角であるから

$\angle APQ = 45° \div 2$
$= 22.5°$