

6/4 チェックテスト

1(1) $x = \sqrt{15} - 3$, $y = \sqrt{15} + 3$ とき

$$\begin{aligned} x^2 + 2xy + y^2 &= (x+y)^2 \\ &= (\sqrt{15}-3 + \sqrt{15}+3)^2 \\ &= (2\sqrt{15})^2 \\ &= 4 \times 15 \\ &= 60 \end{aligned} \quad \textcircled{4}$$

(3) $\sqrt{216n}$

$$\begin{aligned} 216 &= 2^3 \times 3^3 \\ &= 2^2 \times 2 \times 3^2 \times 3 \end{aligned}$$

$$\begin{cases} n_1 = 2 \times 3 = 6 \\ n_2 = 6 \times 2^2 = 24 \\ n_3 = 6 \times 3^2 = 54 \end{cases}$$

A. $n = 6, 24, 54$ ④

(2) $x = y = \sqrt{5} - 2$ とき

$$\begin{aligned} x^2 - 2xy + y^2 &= (x-y)^2 \\ &= (\sqrt{5}-2 - (\sqrt{5}-2))^2 \\ &= 0^2 \\ &= 0 \end{aligned}$$

(4) $\sqrt{\frac{162}{n}}$

$$162 = 2 \times 3^4 = 2 \times 3^2 \times 3^2$$

$$\begin{cases} n_1 = 2 \\ n_2 = 2 \times 3^2 = 18 \\ n_3 = 2 \times 3^2 \times 3^2 = 162 \end{cases}$$

A. $n = 2, 18, 162$ ④

(5) $\sqrt{150 - 5n}$

150より小さい2乗の数は

144, 121, 100, 81, 64, 49, 36, 25, 16, 9, 4, 1, 0 OK!

5n 倍数 - 5n 倍数 = 5n 倍数 かつ 偶数 100, 25, 0 など

$$\begin{aligned} 150 - 5n &= 100 \\ 5n &= 50 \\ n &= 10 \end{aligned}$$

$$\begin{aligned} 150 - 5n &= 25 \\ 5n &= 125 \\ n &= 25 \end{aligned}$$

$$\begin{aligned} 150 - 5n &= 0 \\ 5n &= 150 \\ n &= 30 \end{aligned}$$

A. $n = 10, 25, 30$ ④

<算数クイズ解答>

① 右の図のような立体ができるが、このような図を書かなくても、頭の中で立体をイメージできるようにすること。

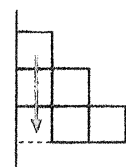
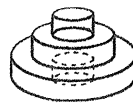
(1) 一番上にある正方形を、一番下のくぼんでいるところに移しても、回転してできる立体の体積は変わらない。このとき、立体は、



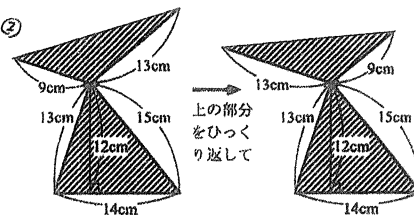
となる。この立体の体積は、 $2 \times 2 \times 3.14 \times 1 + 3 \times 3 \times 3.14 \times 1 = 13 \times 3.14 = 40.82 \text{ (cm}^3\text{)}$

(2)
$$\begin{aligned} &3 \times 3 \times 3.14 \times 2 + 1 \times 2 \times 3.14 \times 1 \times 2 \\ &+ 2 \times 2 \times 3.14 \times 1 + 3 \times 2 \times 3.14 \times 1 \\ &= (18 + 4 + 4 + 6) \times 3.14 \\ &= 100.48 \text{ (cm}^3\text{)} \end{aligned}$$

(1) $13\pi \text{ cm}^3$ 答(1) (40.82) cm^3
(2) $2\pi \text{ cm}^3$ 答(2) (100.48) cm^3



②



上の部分をひっくり返して

ぴったりくっつける

右の図において、

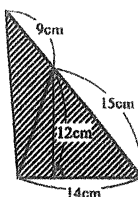
とすると、イの



部分の面積は、 $14 \times 12 \div 2 = 84 \text{ (cm}^2\text{)}$ で、 $A : I = 9 : 15 = 3 : 5$ だから、 $A = 84 \div 5 \times 3 = 50.4 \text{ (cm}^2\text{)}$ 。

斜線部分の面積 = $84 + 50.4 = 134.4 \text{ (cm}^2\text{)}$

答 (134.4) cm^2



<Challenge!!解答> (+5点ずつ)

(1) $\frac{2}{3}$ (2) 117 (3) 2 (4) ± 1

漢字の解答 (+0.5点ずつ)

平成 27 年度

問1 (1)ちせつ (2)きょうこく (3)ゆだ(ねる) (4)警笛 (5)染(める)

平成 27 年度

問1 (1)せきはい (2)ちき (3)たぐ (4)生地 (5)手綱

<Challenge!!>

$$\begin{aligned} \textcircled{1} \quad x^3y + xy^3 &= xy(x^2 + y^2) \\ &= \frac{5-1}{\sqrt{3}} \times \frac{5-1}{\sqrt{3}} \left\{ \left(\frac{\sqrt{3}+1}{\sqrt{3}} \right)^2 + \left(\frac{\sqrt{3}-1}{\sqrt{3}} \right)^2 \right\} \\ &= \frac{2-1}{3} \left(\frac{2+2\sqrt{3}+1}{3} + \frac{2-2\sqrt{3}+1}{3} \right) \\ &= \frac{1}{3} \left(\frac{3+2\sqrt{3}+3-2\sqrt{3}}{3} \right) \\ &= \frac{1}{3} \times 2 \\ &= \frac{2}{3} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad x+y &= 3, \quad x^2+y^2 = 5 \text{ ②} \\ (x+y)^2 &= 3^2 \\ x^2+2xy+y^2 &= 9 \quad \sqrt{x^2+y^2=5} \text{ ①} \\ 2xy &= 9 - (x^2+y^2) \\ 2xy &= 9-5 \\ 2xy &= 4 \\ xy &= 2 \\ (x-y)^2 &= x^2-2xy+y^2 \\ (x-y)^2 &= x^2+y^2-2xy \leftarrow \text{①} \\ (x-y)^2 &= 5-2 \times 2 \\ (x-y)^2 &= 5-4 \\ (x-y)^2 &= 1 \\ x-y &= \pm 1 \quad \left[\begin{array}{l} \text{平方根} \\ \leftarrow \end{array} \right. \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad x &= \frac{\sqrt{3}+1}{\sqrt{3}-\sqrt{3}}, \quad y = \frac{\sqrt{3}-1}{\sqrt{3}+\sqrt{3}} \\ x-y &= \frac{1+\sqrt{3}}{\sqrt{3}-\sqrt{3}} - \frac{\sqrt{3}-1}{\sqrt{3}+\sqrt{3}} \\ &= \frac{(\sqrt{3}+1)^2}{(\sqrt{3}-\sqrt{3})(\sqrt{3}+\sqrt{3})} - \frac{(\sqrt{3}-1)^2}{(\sqrt{3}+\sqrt{3})(\sqrt{3}-\sqrt{3})} \\ &= \frac{7+2\sqrt{3}+3}{7-3} - \frac{7-2\sqrt{3}+3}{7-3} \\ &= \frac{10+2\sqrt{3}+10-2\sqrt{3}}{4} \\ &= 5 \end{aligned}$$

$$\begin{aligned} xy &= \frac{\sqrt{3}+1}{\sqrt{3}-\sqrt{3}} \times \frac{\sqrt{3}-1}{\sqrt{3}+\sqrt{3}} \\ &= \frac{7-3}{7-3} \\ &= 1 \\ 5x^2+2xy+5y^2 &= 5x^2+5y^2+2xy \\ &= 5(x^2+y^2)+2xy \\ &= 5\{(x+y)^2-2xy\}+2xy \\ &= 5(x+y)^2-10xy+2xy \\ &= 5(x+y)^2-8xy \leftarrow \text{①} \\ &= 5 \times 5^2 - 8 \times 1 \\ &= 125-8 \\ &= 117 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad x+y &= 4, \quad x-y = \sqrt{2} \text{ ②} \\ (x+y)^2 &= 4^2, \quad (x-y)^2 = (\sqrt{2})^2 \\ x^2+2xy+y^2 &= 16-④, \quad x^2-2xy+y^2 = 2-⑤ \\ \textcircled{4}-\textcircled{5} & \\ x^2+2xy+y^2 &= 16 \\ +) \quad x^2-2xy+y^2 &= 2 \\ \hline 2x^2+2y^2 &= 18 \\ x^2+y^2 &= 9 \\ \textcircled{1}-\textcircled{2} & \\ x^2+2xy+y^2 &= 16 \\ -) \quad x^2-2xy+y^2 &= 2 \\ \hline 4xy &= 14 \\ xy &= \frac{7}{2} \end{aligned}$$

$$\begin{aligned} \sqrt{x^2+y^2} &= \frac{10}{5}xy \leftarrow \text{①} \\ &= \sqrt{9 - \frac{10}{5} \times \frac{7}{2}} \\ &= \sqrt{9-7} \\ &= \sqrt{2} \\ &= 2 \end{aligned}$$