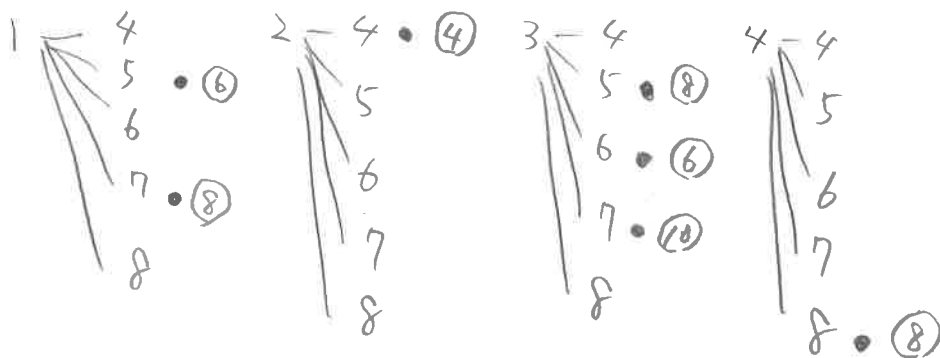


1. (6)

○は得点



$\frac{7}{20}$

(7) $a = 10n + n, b = 10n + m$ とする (m, n は1けたの自然数)

$$\begin{aligned} & \frac{b^2 - a^2}{99} \\ &= \frac{(b+a)(b-a)}{99} \\ &= \frac{(10n+m+10n+n)(10n+m-10n-n)}{99} \\ &= \frac{(11n+11m)(9n-9m)}{99} \\ &= \frac{11(n+m) \cdot 9(n-m)}{99} \end{aligned}$$

- 24 × 1
- 12 × 2
- 8 × 3
- 6 × 4

$(n+m)(n-m) = 24$

積が24になる組み合わせは右の4通り

[$n+m > n-m$ なので逆は考えなくてOK]

m, n は1けたの自然数なので 24 × 1 は除外

加減法で
とさす

$$\begin{aligned} n+m &= 12 \\ n-m &= 2 \\ \hline & \downarrow \\ n &= 7, m = 5 \end{aligned}$$

$$\begin{aligned} n+m &= 8 \\ n-m &= 3 \\ \hline 2n &= 11 \\ n &= \frac{11}{2} \text{ 不適} \end{aligned}$$

$$\begin{aligned} n+m &= 6 \\ n-m &= 4 \\ \hline n &= 5, m = 1 \end{aligned}$$

$a = 57, 15$

1. (8) $y = \frac{1}{5}x^2$ に $x=5$ を代入して $A(5, 5) \dots \textcircled{1}$

$\textcircled{1}$ と $B(0, -1)$ より 直線 AB の式は $y = \frac{6}{5}x - 1 \dots \textcircled{2}$

$\textcircled{2}$ に $x=t$ を代入して $C(t, \frac{6}{5}t - 1) \dots \textcircled{3}$

$y = \frac{1}{5}x^2$ に $x=t$ を代入して $D(t, \frac{1}{5}t^2) \dots \textcircled{4}$

また $E(t, 5) \dots \textcircled{5}$

$\textcircled{3}, \textcircled{4}$ より $DC = \frac{1}{5}t^2 - (\frac{6}{5}t - 1)$

$$= \frac{1}{5}t^2 - \frac{6}{5}t + 1 \dots \textcircled{6}$$

$\textcircled{1}, \textcircled{5}$ より $EA = 5 - t \dots \textcircled{7}$

$\textcircled{6}$ が $\textcircled{7}$ より 3cm 短いので $\textcircled{6} = \textcircled{7} - 3$ が成り立つ

$$\frac{1}{5}t^2 - \frac{6}{5}t + 1 = 5 - t - 3$$

$$t^2 - 6t + 5 = 10 - 5t$$

$$t^2 - t - 5 = 0$$

$$t = \frac{1 \pm \sqrt{1 + 20}}{2}$$

$$= \frac{1 \pm \sqrt{21}}{2}$$

$t < 0$ より $t = \underline{\underline{\frac{1 - \sqrt{21}}{2}}}$