

<令和4年度本試験>

問4 (1) $y = ax^2$ に $A(6, 9)$ を代入

$$9 = 36a$$

$$a = \frac{1}{4}$$

(2) $C(-6, -3)$ $E(5, 0)$

$$m = \frac{0 - (-3)}{5 - (-6)} = \frac{3}{11}$$

$$y = \frac{3}{11}x + n$$
 に $(5, 0)$ を代入

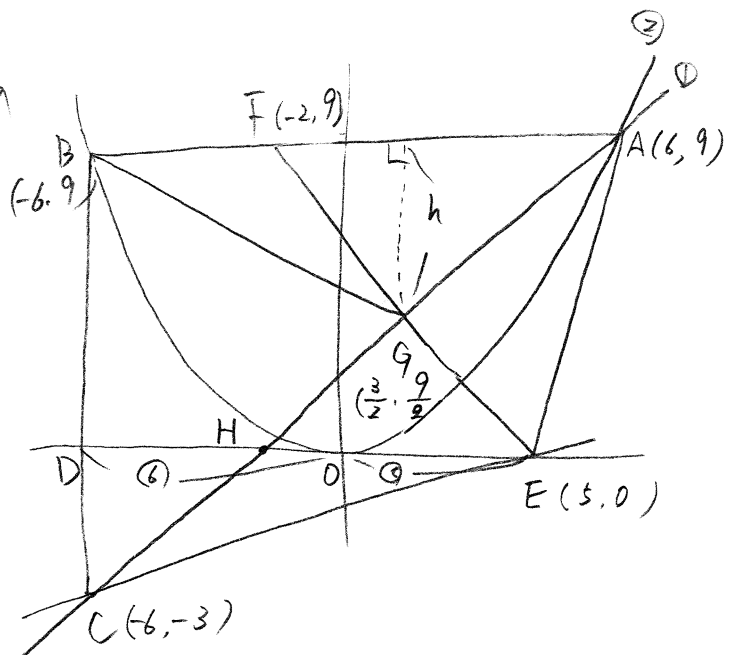
$$0 = \frac{15}{11} + n$$

$$n = -\frac{15}{11}$$

$$\begin{cases} m = \frac{3}{11} \\ n = -\frac{15}{11} \end{cases}$$

$$y = x + 3$$

$$y = \frac{3}{11}x - \frac{15}{11}$$



(3) 「直線 $\textcircled{2}$ が $\triangle AEF$ を二等分するとき」 $\Rightarrow$ 「 G が AE の中点になると」

$$G_y = \frac{9 + 0}{2} = \frac{9}{2}$$

$$y = \frac{9}{2}$$
 を $y = x + 3$ に代入

$$\frac{9}{2} = x + 3$$

$$x = \frac{9}{2} - 3 = \frac{3}{2}$$

$$x = \frac{3}{2} \quad G\left(\frac{3}{2}, \frac{9}{2}\right)$$

$\textcircled{1}$ と x 軸の交点を H とすると

$$y = 0$$
 を $y = x + 3$ に代入

$$0 = x + 3$$

$$x = -3 \quad H(-3, 0)$$

$$\frac{F_x + 5}{2} = \frac{3}{2} \quad \therefore F_x = 3 - 5 = -2$$

$$F(-2, 9)$$

$$BF = -2 - (-6) = 4$$

$$\triangle BGF \text{ の高さ } h = 9 - \frac{9}{2} = \frac{9}{2}$$

$$\triangle BGF : \triangle CEG$$

$$= 4 \times \frac{9}{2} \times \frac{1}{2} : 8 \times \left(\frac{9}{2} + 3\right) \times \frac{1}{2}$$

$$= \frac{9}{2} : 9 + 6$$

$$= \frac{9}{2} : 15$$

$$= 9 : 30$$

$$= 3 : 10$$

<令和3年度本試験>

問4

(ア) $y = ax^2$ に $A(-5, 5)$ を代入

$$5 = 25a$$

$$a = \frac{1}{5} \quad \textcircled{4}$$

(イ) $x = 5 - \frac{10}{3} = \frac{15}{3} - \frac{10}{3} = \frac{5}{3}$

$$C\left(\frac{5}{3}, 5\right)$$

$$E(-3, -3)$$

$$y = ax + b \text{ となる}$$

$$\begin{cases} 5 = \frac{5}{3}a + b & 5 = \frac{5}{3}a + 3a - 3 \\ -3 = -3a + b & 15 = 5a + 9a - 9 \end{cases}$$

$$b = 3a - 3$$

$$14a = 24$$

$$a = \frac{24}{14} = \frac{12}{7} \text{ m}$$

$$5 = \frac{5}{3} \times \frac{12}{7} + b$$

$$b = 5 - \frac{20}{7}$$

$$b = \frac{35}{7} - \frac{20}{7} = \frac{15}{7} \text{ n}$$

$$y = \frac{12}{7}x + \frac{15}{7}$$

(ウ) $\triangle FED$ の高は EH と等しい。

$$\left(\frac{10}{3} + 6\right) \times 8 \times \frac{1}{2} - 6 \times h \times \frac{1}{2} = \frac{20}{3} \times 8 \times \frac{1}{2}$$

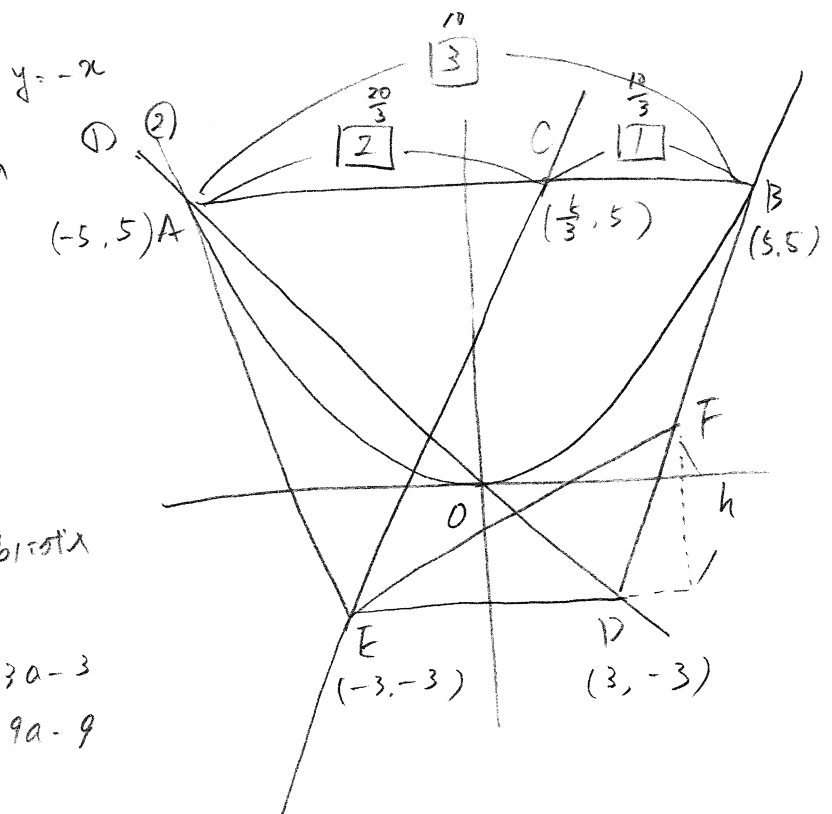
$$\frac{28}{3} \times 4 - 3h = \frac{80}{3}$$

$$3h = \frac{112}{3} - \frac{80}{3}$$

$$h = \frac{32}{9}$$

$$Fy = -3 + \frac{32}{9}$$

$$= -\frac{27}{9} + \frac{32}{9} = \frac{5}{9}$$



$$BD: y = 4x - 15$$

$$\frac{5}{9} = 4x - 15$$

$$4x = \frac{5}{9} + 15$$

$$4x = \frac{5}{9} + \frac{135}{9}$$

$$4x = \frac{140}{9} \Rightarrow x = \frac{35}{9}$$

$$A. F\left(\frac{35}{9}, \frac{5}{9}\right)$$

(令和4年度類題)

(7) $y = -\frac{1}{2}x - 3$ に $x = 1$ を代入

$$y = -\frac{1}{2} - \frac{6}{2}$$

$$y = -\frac{7}{2} \quad \underline{C(1, -\frac{7}{2})}$$

(1) ② を求める

$y = mx - 5$ に $(1, -\frac{7}{2})$ を代入

$$-\frac{7}{2} = m - 5$$

$$m = -\frac{7}{2} + \frac{10}{2}$$

$$m = \frac{3}{2} \quad \textcircled{2} \underline{y = \frac{3}{2}x - 5}$$

③ を求める

$y = ax + \frac{3}{2}$ に $A(6, 0)$ を代入

$$0 = -6a + \frac{3}{2}$$

$$6a = \frac{3}{2}$$

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

$$a = \frac{1}{4} \quad \textcircled{3} \underline{y = \frac{1}{4}x + \frac{3}{2}}$$

(2) ② と x 軸との交点を E とする

$y = \frac{3}{2}x - 5$ に $y = 0$ を代入

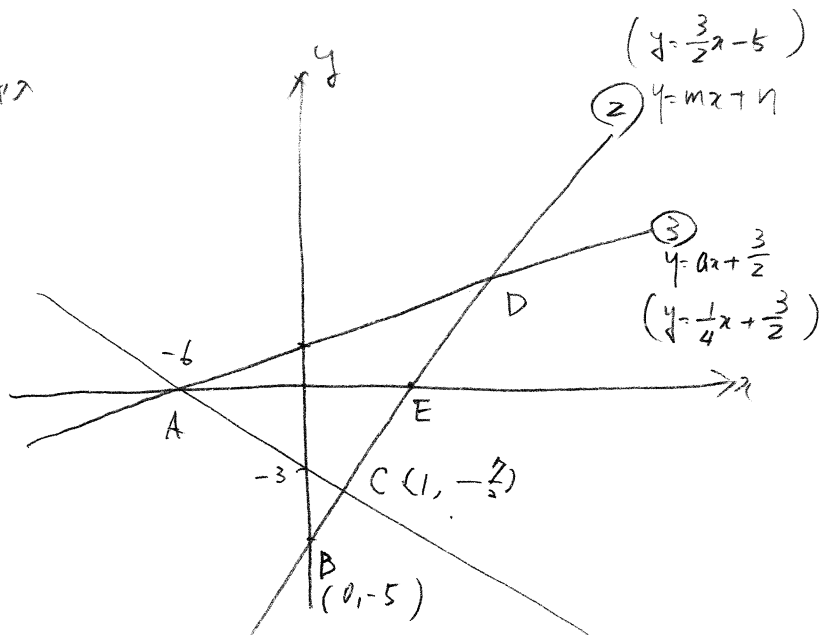
$$0 = \frac{3}{2}x - 5$$

$$\frac{3}{2}x = 5$$

$$x = 5 \times \frac{2}{3}$$

$$x = \frac{10}{3}$$

$$AE = \frac{10}{3} - (-6) = \frac{28}{3}$$



D を求める

$$\begin{cases} y = \frac{3}{2}x - 5 \\ y = \frac{1}{4}x + \frac{3}{2} \end{cases}$$

$$\frac{3}{2}x - 5 = \frac{1}{4}x + \frac{3}{2}$$

$$6x - 20 = x + 6$$

$$5x = 26$$

$$x = \frac{26}{5}$$

$$\begin{aligned} y &= \frac{3}{2} \times \frac{26}{5} - 5 \\ &= \frac{39}{5} - \frac{25}{5} \\ &= \frac{14}{5} \end{aligned}$$

$$\underline{D(\frac{26}{5}, \frac{14}{5})}$$

$$\Delta ACD = \frac{28}{3} \times (\frac{14}{5} + \frac{7}{2}) \times \frac{1}{2}$$

$$= \frac{7 \times 7}{3} \times \frac{28+35}{10 \times 5}$$

$$= \frac{7 \times 7 \times 21}{75 \times 5}$$

$$= \frac{147}{5}$$

良い計算練習にしたいですね

