

2009年度 神奈川県公立高校入試 数学

1 (ア) $3 - (-4) = 3 + 4 = \underline{\underline{7}}$

(イ) $1 + 2 \times (3 - 8) = 1 + 2 \times (-5) = 1 - 10 = \underline{\underline{-9}}$

(ウ) $-\frac{1}{3} + \frac{5}{7} = -\frac{7}{21} + \frac{15}{21} = \underline{\underline{\frac{8}{21}}}$

(エ) $28ab^2 \div 7b = \underline{\underline{4ab}}$

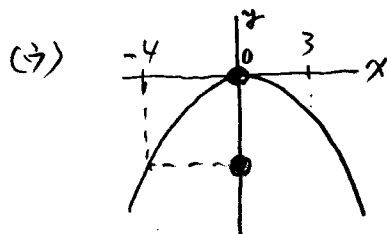
$$\begin{array}{l|l} \text{(オ)} \frac{1}{9}(3x+7) - \frac{1}{3}(x+1) & = \frac{3x+7-3x-3}{9} \\ = \frac{3x+7}{9} - \frac{x+1}{3} & = \frac{4}{9} \\ = \frac{3x+7-3(x+1)}{9} & \underline{\underline{= \frac{4}{9}}} \end{array}$$

(カ) $\frac{12}{\sqrt{6}} - \sqrt{54} = \frac{\cancel{12}\sqrt{6}}{\cancel{6},} - 3\sqrt{6} = -\sqrt{6}$

(キ) $(x-1)(x+5) + (x-2)^2$
 $= x^2 + 4x - 5 + x^2 - 4x + 4$
 $= 2x^2 - 1$

$$\begin{aligned}
 2. (ア) \quad & x(x-3) - 18 \\
 &= x^2 - 3x - 18 \\
 &= (x-6)(x+3)
 \end{aligned}$$

$$(イ) \quad (x-6)^2 = 5 \quad x-6 = \pm\sqrt{5} \quad \underline{x = 6 \pm \sqrt{5}}$$



$$y = -\frac{1}{2} \times (-4)^2 = -8$$

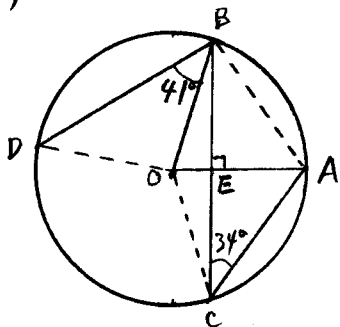
$$-8 \leq y \leq 0$$

$$\underline{a = -8, b = 0}$$

$$\begin{aligned}
 (エ) \quad & \sqrt{\frac{45}{2}n} \rightarrow n \text{ は } 2 \text{ の倍数} \\
 & 45 = 3^2 \times 5 \quad \left. \vphantom{\sqrt{\frac{45}{2}n}} \right\} \sqrt{\frac{3^2 \times 5}{2} \times (2 \times 5)}
 \end{aligned}$$

$$\underline{n = 10}$$

(オ)



左の図でBCとAOの交点をEとすると
半径OAは弦BCを直角に二等分するので
 $\triangle ABC$ は $AB=AC$ の二等辺三角形。

よって

$$\angle BAC = 180 - 34 \times 2 = 112^\circ$$

$$\angle OAC = \angle OCA = \angle OAB = \angle OBA = 112 \div 2 = 56^\circ$$

$$\angle AOC = \angle AOB = 180 - 56 \times 2 = 68^\circ$$

$$\angle BOD = 180 - 41 \times 2 = 98^\circ$$

$$\angle COD = 360 - (98 + 68 \times 2) = 126^\circ$$

$$\widehat{CD} = 20 \times \pi \times \frac{126}{360} = 7\pi$$

$$\underline{A. 7\pi \text{ cm}}$$

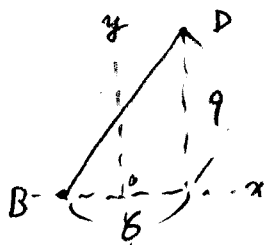
3. (7) ① $y = x^2$ に A の x 座標 $x = -3$ を代入 $y = (-3)^2 = 9$... AB の長さは 9.

AC : CB = 1 : 2 より $9 \times \frac{2}{1+2} = 6$... C(-3, 6)

② $y = ax^2$ に C(-3, 6) を代入 $6 = (-3)^2 a$ $a = \frac{6}{9} = \frac{2}{3}$

A. $a = \frac{2}{3}$

(1) A(-3, 9) \rightarrow D(3, 9). また問題文より B(-3, 0)



傾きは $\frac{9}{6} = \frac{3}{2}$ 切片は $9 \div 2 = \frac{9}{2}$

A. $m = \frac{3}{2}, n = \frac{9}{2}$

別解 D(3, 9) B(-3, 0) を $y = mx + n$ に代入して連立方程式を解く。

(2) 直線 BE $\rightarrow y = \frac{9}{3}x + 9 \rightarrow y = 3x + 9$

直線 CD



切片 $(6+9) \div 2 = \frac{15}{2}$

$y = \frac{3}{6}x + \frac{15}{2} = \frac{1}{2}x + \frac{15}{2}$

点 F $\begin{cases} y = 3x + 9 \\ y = \frac{1}{2}x + \frac{15}{2} \end{cases}$

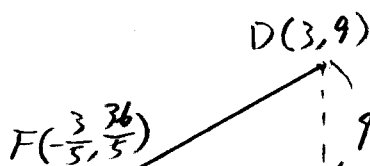
$3x + 9 = \frac{1}{2}x + \frac{15}{2}$ $\times 2$

$6x + 18 = x + 15$

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

$y = 3 \times (-\frac{3}{5}) + 9 = -\frac{9}{5} + \frac{45}{5} = \frac{36}{5}$

$F(-\frac{3}{5}, \frac{36}{5})$



$9 - \frac{36}{5} = \frac{9}{5}$

$CF : FD = \frac{6}{5} : \frac{9}{5} = 2 : 3$

$\frac{36}{5} - 6 = \frac{6}{5}$

A. 2 : 3

4. (ア) 小のサイコロで 同じ箱に2枚入るのは 1のとき 2の箱に2枚
6のとき 5の箱に2枚

よって 大 小 大 小
2-2 5-5 の2通り

全体は $6 \times 6 = 36$ 通り

$$\frac{2}{36} = \frac{1}{18}$$

$$\underline{A. \frac{1}{18}}$$

- (イ) 3つの箱がとなりあわないのは
- | | | | |
|-------|---|-----|-------|
| 1-3-5 | → | 5-2 | , 1-4 |
| 1-3-6 | → | 6-2 | |
| 2-4-6 | → | 2-5 | , 6-3 |
| 1-4-6 | → | 1-5 | |

6通り

$$\frac{6}{36} = \frac{1}{6}$$

$$\underline{A. \frac{1}{6}}$$

5. 〇の数をえ方をくふうする。

例

もし1枚のダイヤルを抜かなければ

$n=3$ のとき たての「共通辺」は $3-1=2$ 本 → シールは $6 \times 2 = 12$ 枚
よこ 2本 → 6

ダイヤル1枚も抜くと 4枚のシールが減るので $6 \times 2 - 1 = 11$ 枚

これを n で表すと $n(n-1) \times 2 - 4 = 2n^2 - 2n - 4$ (枚) のシール

(ア) $2 \times 5^2 - 2 \times 5 - 4 = 50 - 14 = 36$

$$\underline{A. 36 \text{ 枚}}$$

(イ) $2n^2 - 2n - 4 = 308$

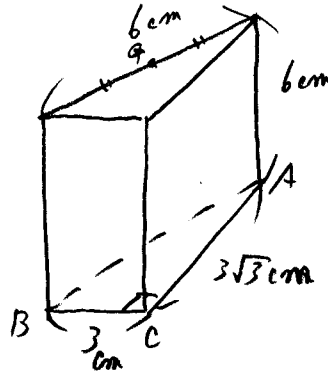
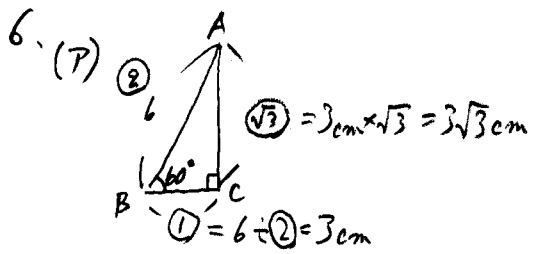
$$n^2 - n - 2 = 154$$

$$n^2 - n - 156 = 0$$

$$(n+12)(n-13) = 0$$

$$n = -12, 13$$

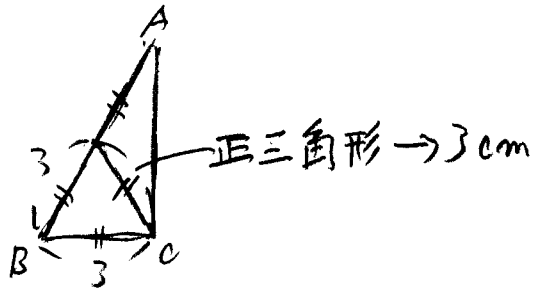
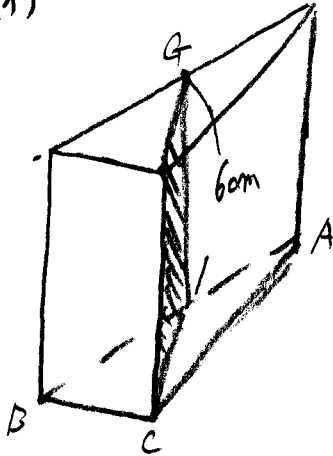
$$\underline{A. 13}$$



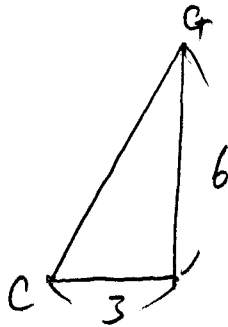
$$3 \times 3\sqrt{3} \times \frac{1}{2} \times 6 = 27\sqrt{3}$$

A. $27\sqrt{3}\text{ cm}^3$

(1)



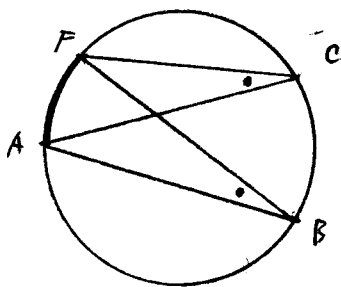
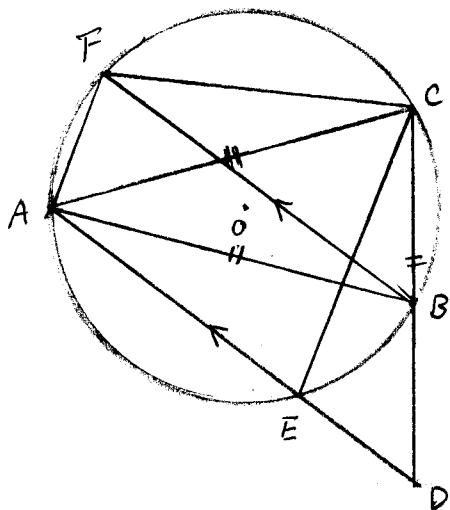
$$CG = \sqrt{3^2 + 6^2} = 3\sqrt{5}$$



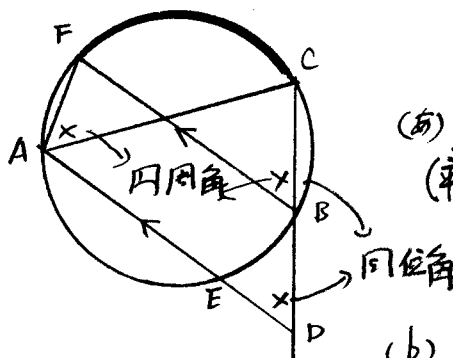
A. $3\sqrt{5}\text{ cm}$

7

(7)

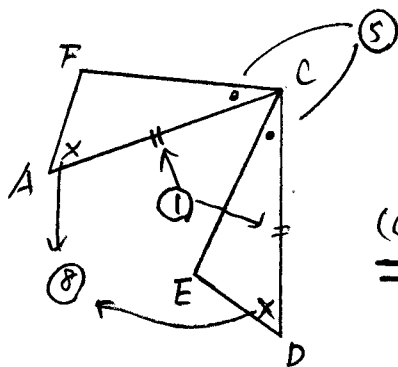


(a) AF



(a) 1
(平行線の同位角
は等しい)

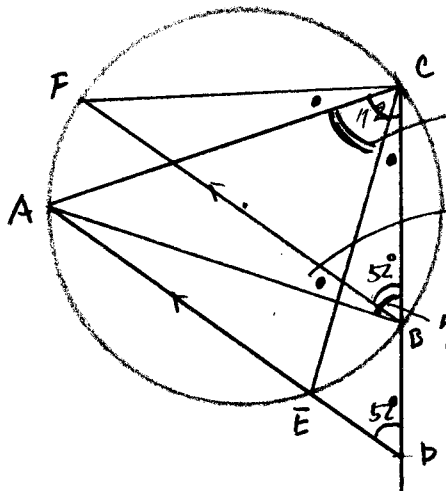
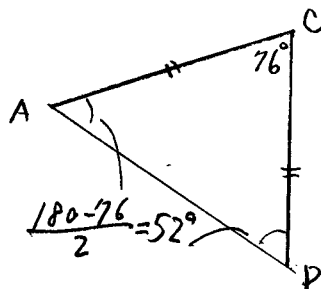
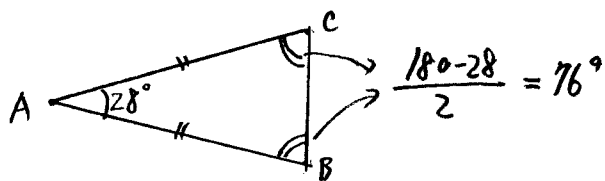
(b) ∠CBF



(c) 5

(ii) 6 (一辺とその両端の角が
それぞれ等しい)

(1)



$$72 - 20 = 52$$

$$72 - 52 = 20^\circ$$

A, 52°