

國中第四冊

立即練習二

p. 5 (1)

$$367 = 6 \times 61 + 1$$

$$61 \times 2 + 1 = 123$$

p. 5 (2)

$$[(5x + 4y) + (x - 3y)] \div 2 = 9 \Rightarrow 6x + y = 18$$

$$(5x + 3y) + (x - 2y) = 6x + y = 18$$

∴ 等差中項為 9

立即練習三

p. 12 (1)

∴ 分母均比分子大 1

∴ 第 100 個分數的分母為 $2 \times 100 + 1 = 201$

∴ 第 100 個分數為 $\frac{200}{201}$

p. 12(2)

∴ 第 2 層 $\Rightarrow 1 + 2 + 1 = 2^2$

第 3 層 $\Rightarrow 1 + 2 + 3 + 2 + 1 = 9 = 3^2$

第 4 層 $\Rightarrow 4^2$

∴ $169 = 13^2$ 所以出現在第 13 層

p. 12(3)

圖(一)有黑棋 $\Rightarrow 1$

圖(二)有黑棋 $\Rightarrow 2^2$

圖(三)有黑棋 $\Rightarrow 3^2$

圖(十六)有黑棋 $\Rightarrow 16^2 = 256$ 顆

p. 12(4)

$$a_1 = 1 \quad d = 3$$

$$1 + 3(n - 1) = 1234 \quad 3(n - 1) = 1233$$

$$n - 1 = 411 \quad n = 412$$

$$412 \div 15 = 27.46666 \dots \Rightarrow 28 \text{ 頁}$$

p. 12(5)

$$A : a_1 = 11 \quad d = 17 ; \quad B : a_1 = 7 \quad d = 13$$

$$11 + 17(m - 1) = 17m - 6$$

$$7 + 13(n - 1) = 13n - 6$$

$$17m - 6 = 13n - 6 \Rightarrow 17m = 13n$$

$$11 + 17(13 - 1) = 215$$

$$17m = 13 \times (17 \times 2) \quad m = 26$$

$$\Rightarrow [11 + 17 \times (26 - 1)] - 215 = 221$$

立即練習三

p. 20(1)

設此三數為 $x - t$ 、 x 、 $x + t$

$$(x - t) + t + (x + t) = 27 \Rightarrow 3t = 27 \Rightarrow x = 9$$

\therefore 此三數為 $9 - t$ 、 9 、 $9 + t$

$$(9 - t)(9)(9 + t) = 693$$

$$81 - t^2 = 77 \Rightarrow t^2 = 4 \Rightarrow t = \pm 2$$

\therefore 此三數為 7 、 9 、 11 最大數 - 最小數 = $11 - 7 = 4$

p. 20(2)

$$a_1 + a_2 + \dots + a_{50} = 100 \Rightarrow S_{50} = \frac{50}{2}(2a_1 + 49d) = 100 \dots \textcircled{1}$$

$$a_{51} + a_{52} + \dots + a_{100} = 200 \Rightarrow S_{51 \sim 100} = \frac{50}{2}(2a_{51} + 49d)$$

$$= 200 \dots \textcircled{2}$$

$$\textcircled{1} - \textcircled{2} \Rightarrow a_{51} - a_1 = 2 \Rightarrow a_1 + 50d - a_1 = 2$$

$$\therefore d = 0.04 \quad \therefore a_2 - a_1 = d = 0.04$$

p. 20(3)

3月n日時，其所貼的長方型磁磚圖樣的長為 $2n + 1$ 塊

，寬為 $2n - 1$ 塊

$$\therefore (2n + 1)(2n - 1) = 483 \Rightarrow 4n^2 - 1 = 483$$

$$\Rightarrow n^2 = 121, n > 0 \quad \therefore n = 11 \quad \text{在 3 月 11 號}$$

p. 20(4)

$$a_n = 18 + (n - 1) \left(-\frac{1}{3}\right) \geq 0, n \leq 55 \quad a_{55} = 0$$

$$a_{54} = 18 + 53 \times \left(-\frac{1}{3}\right) = \frac{1}{3} > 0$$

$$S_{54} = S_{55} = 495$$

p. 20(5)

$$a_7 + a_8 + \cdots + a_{11} = 255 \Rightarrow a_9 = 51$$

$$a_{45} + a_{46} + \cdots + a_{49} = -125 \Rightarrow a_{47} = -25$$

$$\frac{a_9 + a_{47}}{2} = \frac{51 + (-25)}{2} = 13 = a_{28}$$

$$a_{25} + a_{26} + \cdots + a_{31} = a_{28} \times 7 = 13 \times 7 = 91$$

立即練習五

p. 41(1)

延長 \overline{MF} 交 \overline{AB} 於 E 點

則斜線面積 = 四邊形 FEBC + 扇形 CFM - \triangle BEM

$$\begin{aligned} &= 10 \times 5 + \frac{1}{4} \times \pi \times 5^2 - \frac{1}{2} \times 5 \times 15 \\ &= \frac{25}{2} + \frac{25}{4} \pi \quad (\text{平方公分}) \end{aligned}$$

p. 41(2)

$$360^\circ \div 60^\circ = 6$$

$$360^\circ \div 90^\circ = 4$$

$$360^\circ \div 108^\circ = 3 \cdots 36 \Rightarrow \text{會有空隙}$$

$$360^\circ \div 120^\circ = 3$$

p. 41(3)

$$\therefore \overline{AF} = 5 \Rightarrow \overline{CH} = 5 \quad \therefore \overline{CD} = \overline{CH} + \overline{HD} = 8$$

p. 41(4)

① ∵ 正方形紙片間夾角為 60° 成一正三角形 $\therefore \overline{AB} = 1$

② 6 個正方形 + 1 個六邊形 $\therefore 6 + \frac{\sqrt{3}}{4} \times 1 \times 6 = 6 + \frac{3\sqrt{3}}{2}$

立即練習三

p. 46(1)

① $\overline{BP} - \overline{AP} = \frac{1}{2}\overline{AB} + \overline{PM} - \left(\frac{1}{2}\overline{AB} - \overline{PM}\right) = 2\overline{PM} \quad \therefore k = 2$

p. 46(2)

$\frac{1}{2} \times 3 \times 4 + \frac{1}{2} \times 7 \times (5 + 3) + \frac{1}{3} \times 6 \times 7 = 55$ (平方單位)

立即練習四

p. 52(1)

以 A 為圓心，1.5 公分為半徑畫弧，在 y 軸左側，以 B 為圓心，3 公分為半徑畫弧，之前弧於第二、三象限

p. 52(2)

③

p. 52(3)

③

立即練習三

p. 56(1)

$(3^2 - 2^2)\pi = 5\pi \quad (2^2 - 1^2)\pi = 3\pi$

$2(5\pi + 3\pi + \pi) = 18\pi$ (立方公分)

p. 56(2)

由圖可知，有 3 支鋼管等長，因此，上下 2 底面三角形的邊長

由 4 支 40 公分及 2 支 50 公分的鋼管構成

立即練習五

p. 78(1)

設 $\angle C''ED = x^\circ$ ， \overline{AB} 與 \overline{CD} 交於 F 點

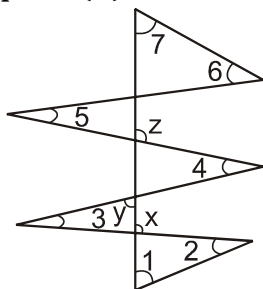
$$\angle C''FB = 180 - 162 = 18^\circ$$

$$\angle C + \angle C''FB = \angle B + \angle BEC \quad \angle C = \angle B = 60^\circ$$

$$\therefore \angle CFB = \angle BEC = 18^\circ$$

$$\therefore 18 + 2\angle x = 180 \quad \therefore \angle x = 81^\circ$$

p. 78(2)



$$\begin{aligned} \angle 1 + \angle 2 - \angle 3 + \angle 4 - \angle 5 + \angle 6 + \angle 7 \\ &= \angle x - \angle 3 + \angle 4 - \angle 5 + \angle 6 + \angle 7 \\ &= \angle y + \angle 4 - \angle 5 + \angle 6 + \angle 7 \\ &= \angle z - \angle 5 + \angle 6 + \angle 7 \\ &= \angle t + \angle 6 + \angle 7 = 180^\circ \end{aligned}$$

立即練習六

p. 89(1)

②

p. 89(2)

$\therefore \triangle APQ$ 、 $\triangle UBT$ 、 $\triangle RSC$ 皆為正三角形

$$\therefore \overline{AP} = \overline{PU} = \overline{UB} = \frac{a}{3} \quad \text{故正六邊形邊長 } \frac{a}{3} \times 6 = 2a$$

p. 89(3)

① $\triangle ABC$ 面積 = $\triangle DEF$ 面積 = $12 \times 21 \div 2 = 126$ 平方公分

② $\overline{EH} = \sqrt{20^2 - 12^2} = 16 \Rightarrow \overline{HF} = 21 - 16 = 5$

$$\overline{DF} = \overline{AC} = \sqrt{5^2 + 12^2} = 13$$

$$\therefore 126 = \frac{1}{2} \times 13 \times \overline{BP} \Rightarrow \overline{BP} = \frac{252}{13}$$

p.89(4)

連接 \overline{CF} ，則 $\triangle AEF \cong \triangle DFC$ (SAS)

$$\therefore \angle 1 = a, \overline{EF} = \overline{FC}$$

$\triangle EFC$ 為等腰直角三角形

$$\therefore \angle 1 = \angle FCB = a \quad \therefore A - B = 45^\circ$$

立即練習三

p.96(1)

$$\overline{OB} > \overline{OA} > \overline{OC}$$

p.96(2)

①在 $\triangle ABD$ 、 $\triangle ACD$ 中 $\because \overline{BD} = \overline{CD}, \overline{AB} < \overline{AC}$

$$\therefore \angle ADB < \angle ADC$$

②在 $\triangle BPD$ 、 $\triangle CPD$ 中 $\because \overline{BD} = \overline{CD}, \angle APB < \angle ADC$

$$\therefore \overline{PB} < \overline{PC}$$

③在 $\triangle BPC$ 中 $\because \overline{BP} < \overline{PC} \quad \therefore \angle PCB < \angle PBC$

立即練習四

p.115(1)

$$\angle 1 + 160^\circ + 65^\circ = 360^\circ \quad \therefore \angle 1 = 135^\circ$$

p.115(2)

$$\because \overline{AD} \parallel \overline{BC} \quad \angle 1 = \angle 4, \angle 3 = \angle 4$$

$$\angle 2 + \angle 3 + \angle 4 = 90^\circ \Rightarrow \angle 2 + 2\angle 1 = 90^\circ$$

$$\angle 2 : \angle 1 = 7 : 4 \Rightarrow \angle 1 = 24^\circ, \angle 2 = 42^\circ$$

$$\angle x = 42^\circ + 90^\circ = 132^\circ$$

立即練習六

p.125(1)

$$\because \overline{GH} = \overline{AD} \quad \therefore \overline{BG} + \overline{HC} = \overline{BC} - \overline{AD} = (7 \times 2 - 5) - 5 = 4$$

p.126(2)

$a : b : c = 3 : 7 : 8$ 作 \overline{BC} 平行線

$$b : (c - a) = 7 : 5 \quad \therefore \overline{CD} : \overline{BC} = 7 : 5 \quad \overline{AD} : \overline{CD} = 6 : 7$$

$$\therefore \overline{AD} : \overline{CD} : \overline{BC} = 6 : 7 : 5$$

$$\therefore \overline{CB} = 12 \times \frac{5}{6+7+5} = \frac{10}{3} \text{公分}$$

p.126(3)

$\therefore \overline{DE} \parallel \overline{AB}$ ， $\triangle DEC$ 為正三角形 $\therefore \angle ABE = \angle DEC = 60^\circ$

作 $\overline{EF} \perp \overline{AB}$ $\therefore \triangle AFE = \triangle ADE = \triangle BDE = \triangle DEC$

$$\text{其面積為 } a \quad \therefore \triangle AFE = a \quad \triangle FBE = \frac{1}{2}a \quad \frac{a}{3a + \frac{1}{2}a} = \frac{2}{7}$$

p.126(4)

作一直線 $\overline{B'C'}$ 經過 P 點且與 \overline{BC} 平行

$$\therefore \triangle PCB = 6 \quad \therefore \text{平行四邊形 } BB'C'C \text{ 面積} = 12$$

$$\therefore \triangle PAB = 8, \triangle PCD = 4$$

$$\text{平行四邊形 } ABCD \text{ 面積} = (8 + 4) \times 2 = 24$$

$$\frac{1}{2} \times (24 + 12) = 18 \quad (\text{平方單位})$$

p.126(5)

$$\overline{AD} \parallel \overline{GH} \parallel \overline{BC} \quad \overline{AB} \parallel \overline{EF} \parallel \overline{CD} \quad \therefore \text{甲} \times \text{丙} = \text{乙} \times \text{丁}$$

p.126(6)

$$\therefore \overline{AD} \parallel \overline{BC} \quad \angle 1 = \angle 4, \angle 3 = \angle 4$$

$$\angle 2 + \angle 3 + \angle 4 = 90^\circ \Rightarrow \angle 2 + 2\angle 1 = 90^\circ$$

$$\angle 2 : \angle 1 = 7 : 4 \Rightarrow \angle 1 = 24^\circ, \angle 2 = 42^\circ$$

$$\angle x = 42^\circ + 90^\circ = 132^\circ$$