

§1 二次方程式とその解き方

1. 約 8.5m

2. 2, 3

 $ax^2 = b$ の解き方

3. (1) $x^2 = 9$ $x = \pm 3$ (2) $x^2 = 7$ $x = \pm\sqrt{7}$

4. (1) $x^2 = 18$ $x = \pm 3\sqrt{2}$ (2) $x^2 = \frac{2}{9}$ $x = \pm\frac{\sqrt{2}}{3}$

 $(x+m)^2 = n$ の解き方

5. (1) $(x-2)^2 = 9$ (2) $(x+5)^2 = 27$
 $x-2 = \pm 3$ $x+5 = \pm 3\sqrt{3}$
 $x = 5, -1$ $x = -5 \pm 3\sqrt{3}$

練習

1. (1) $x = \pm 8$ (2) $t = \pm\sqrt{7}$

(3) $x = \pm 2\sqrt{3}$ (4) $\pm\frac{\sqrt{11}}{2}$

2. (1) $x = -1 \pm 7$ (2) $x = 5 \pm \sqrt{5}$
 $x = 6, -8$

§2 二次方程式と因数分解

1. (1) $x = 2, -5$ (2) $x = -4, -2$

2. (1) $(x+2)(x+3) = 0$ $x = -2, -3$ (2) $(x-3)(x+4) = 0$ $x = 3, -4$

(3) $(x+1)(x-3) = 0$ $x = -1, 3$ (4) $(x-1)(x-7) = 0$ $x = 1, 7$

(5) $(x-4)(x-6) = 0$ $x = 4, 6$ (6) $(x+1)(x-8) = 0$ $x = -1, 8$

3. (1) $X(x+5) = 0$ $x = 0, -5$ (2) $x(2x-7) = 0$ $x = 0, \frac{7}{2}$

4. (1) $(x-3)^2 = 0$ $x = 3$ (2) $(x+7)^2 = 0$ $x = -7$

5. (1) $(x-1)(x+3) = 0$ $x = 1, -3$ (2) $x = \pm 7$
 (3) $(x-3)(x-4) = 0$ $x = 3, 4$ (4) $(y-4)^2 = 0$ $y = 4$
 (5) $4x(x+2) = 0$ $x = 0, -2$ (6) $n(n-3) = 0$ $n = 0, 3$

6. (1) $x^2 - x - 2 = 3x - 5$ (2) $x^2 - 9x + 20 = 0$
 $x^2 - 4x + 3 = 0$ $(x-4)(x-5) = 0$ $x = 4, 5$
 $(x-1)(x-3) = 0$ $x = 1, 3$

練習

1. (1) $(x-2)(x+7) = 0$ $x = 2, -7$ (2) $(y+3)(y-9) = 0$ $y = -3, 9$

2. (1) $(x+2)(x+6) = 0$ $x = -2, -6$ (2) $(x+4)(x-5) = 0$ $x = -4, 5$
 (3) $x(x+7) = 0$ $x = 0, -7$ (4) $(x-5)^2 = 0$ $x = 5$
 (5) $(y-1)(y-2) = 0$ $y = 1, 2$ (6) $(n+2)(n-8) = 0$ $n = -2, 8$
 (7) $3x(2x+1) = 0$ $x = 0, -\frac{1}{2}$ (8) $2(x-1)(x+3) = 0$ $x = 1, -3$

3. (1) $(x-1)^2 = 0$ $x = 1$ (2) $x(x+1) = 0$ $x = 0, -1$
 (3) $(y+2)(y-3) = 0$ $y = -2, 3$ (4) $(x-1)(x+5) = 0$ $x = 1, -5$
 (5) $x^2 - 10x + 21 = 5$ (6) $t^2 - 4t + 6 = 2t - 2$
 $x^2 - 10x + 16 = 0$ $t^2 - 6t + 8 = 0$
 $(x-2)(x-8) = 0$ $x = 2, 8$ $(t-2)(t-4) = 0$ $t = 2, 4$

§3 二次方程式の利用

1. 縦の長さを x cm とすると、横の長さは $20-x$ cm

$$x(20-x) = 84$$

$$x^2 - 20x + 84 = 0$$

$$(x-6)(x-14) \quad x = 6, 14$$

縦 6cm, 横 14cm または

縦 14cm, 横 6cm

2. 連続した3つの正の整数を $x, x+1, x+2$ とすると

$$x(x+1) = x + x + 1 + x + 2$$

$$x^2 + x = 3x + 3$$

$$x^2 - 2x - 3 = 0$$

$$(x+1)(x-3) = 0$$

$$x = -1, 3$$

$x > 0$ より $x = 3$

3つの整数は 3, 4, 5

7. (1) 正方形ABCDの面積は $20 \times 20 = 400 \text{ cm}^2$
 4隅の4つの三角形の面積の和は

$$400 - 250 = 150 \text{ cm}^2$$

よって、1つの三角形($\triangle AEH$)の面積は

$$\frac{150}{4} = \frac{75}{2} \text{ cm}^2$$

$AE=x$ とすると、 $AH=20-x$

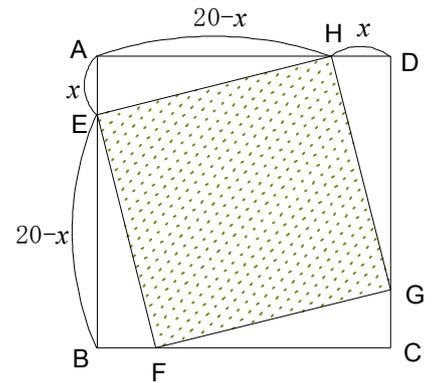
$$\triangle AEH = \frac{1}{2}AE \times AH = \frac{1}{2}x(20-x) = \frac{75}{2}$$

$$x(20-x) = 75$$

$$x^2 - 20x + 75 = 0$$

$$(x-5)(x-15) = 0$$

$$x = 5, 15 \quad 5\text{cm, または } 15\text{cm}$$



- (2) $AP=x$ とすると、 $PB=20-x$

正方形ABCD-4隅の三角形=150

$$20^2 - \frac{1}{2}x^2 \times 2 - \frac{1}{2}(20-x)^2 \times 2 = 150$$

$$400 - \frac{1}{2}x^2 \times 2 - \frac{1}{2}(400 - 40x + x^2) \times 2 = 150$$

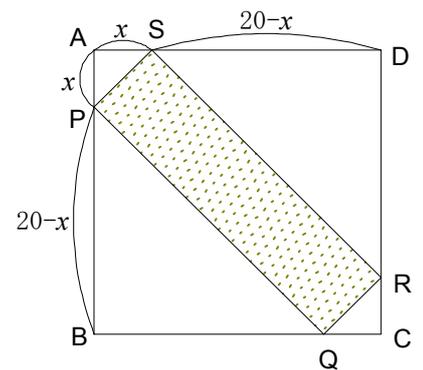
$$400 - x^2 - 400 + 40x - x^2 = 150$$

$$-2x^2 + 40x = 150$$

$$x^2 - 20x + 75 = 0$$

$$(x-5)(x-15) = 0$$

$$x = 5, 15 \quad 5\text{cm, または } 15\text{cm}$$



以上