

## 1.4 Kwadratische formules opstellen.

### Opgave 34:

- a.  $3^2 + 2 \cdot 3 + c = 5$   
 $9 + 6 + c = 5$   
 $15 + c = 5$
- b.  $c = -10$

### Opgave 35:

- a.  $50 + 5b + 7 = 17$   
 $5b = -40$   
 $b = -8$
- b.  $4a + 6 + 5 = 8$   
 $4a = -3$   
 $a = -\frac{3}{4}$

### Opgave 36:

- a.  $9a - 15 + 4 = -20$   
 $9a = -9$   
 $a = -1$   
neem  $y_1 = -x^2 - 5x + 4$  de optie maximum geeft:  $x = -2,5$  en  $y = 10,25$   
dus de top is  $(-2,5; 10,25)$
- b. de optie zero geeft:  $x = -5,7 \vee x = 0,7$

### Opgave 37:

- a.  $-0,02 \cdot 60^2 + 60b = 0$   
 $60b = 72$   
 $b = 1,2$
- b.  $h(30) = 18$  dus 18 m

### Opgave 38:

- a.  $x^2$  is minimaal 0 voor  $x = 0$   
 $(x - 4)^2$  is minimaal 0 voor  $x = 4$   
 $(x - 4)^2 + 5$  is minimaal 0 voor  $x = 4$   
dus de top is  $(4,5)$
- b.  $(-3, -4)$
- c.  $(3,6)$

### Opgave 39:

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

**Opgave 40:**

$p_1$  : de top is  $(-2,-1)$

$$y = a(x+2)^2 - 1 \text{ door } (0,1)$$

$$1 = 4a - 1$$

$$-4a = -2$$

$$a = \frac{1}{2}$$

$$y = \frac{1}{2}(x+2)^2 - 1$$

$$y = \frac{1}{2}(x^2 + 4x + 4) - 1$$

$$y = \frac{1}{2}x^2 + 2x + 2 - 1$$

$$y = \frac{1}{2}x^2 + 2x + 1$$

$p_2$  : de top is  $(2,1)$

$$y = a(x-2)^2 + 1 \text{ door } (1,-1)$$

$$-1 = a + 1$$

$$-a = 2$$

$$a = -2$$

$$y = -2(x-2)^2 + 1$$

$$y = -2(x^2 - 4x + 4) + 1$$

$$y = -2x^2 + 8x - 8 + 1$$

$$y = -2x^2 + 8x - 7$$

$p_3$  : de top is  $(-2,1)$

$$y = a(x+2)^2 + 1 \text{ door } (0,-1)$$

$$-1 = 4a + 1$$

$$-4a = 2$$

$$a = -\frac{1}{2}$$

$$y = -\frac{1}{2}(x+2)^2 + 1$$

$$y = -\frac{1}{2}(x^2 + 4x + 4) + 1$$

$$y = -\frac{1}{2}x^2 - 2x - 2 + 1$$

$$y = -\frac{1}{2}x^2 - 2x - 1$$

$p_4$  : de top is  $(3,0)$

$$y = a(x-3)^2 \text{ door } (0,3)$$

$$3 = 9a$$

$$a = \frac{1}{3}$$

$$y = \frac{1}{3}(x-3)^2$$

$$y = \frac{1}{3}(x^2 - 6x + 9)$$

$$y = \frac{1}{3}x^2 - 2x + 3$$

$p_5$  : de top is  $(0,3)$

$$y = ax^2 + 3 \text{ door } (1,-1)$$

$$-1 = a + 3$$

$$-a = 4$$

$$a = -4$$

$$y = -4x^2 + 3$$

$p_6$  : de top is (2,2)

$$y = a(x-2)^2 + 2 \text{ door } (1,3)$$

$$3 = a + 2$$

$$a = 1$$

$$y = (x-2)^2 + 2$$

$$y = x^2 - 4x + 4 + 2$$

$$y = x^2 - 4x + 6$$

#### **Opgave 41:**

a. de top is (2,6)

$$y = a(x-2)^2 + 6 \text{ door } (4,4)$$

$$4 = 4a + 6$$

$$-4a = 2$$

$$a = -\frac{1}{2}$$

$$y = -\frac{1}{2}(x-2)^2 + 6$$

b.  $y = -\frac{1}{2}(x^2 - 4x + 4) + 6$

$$y = -\frac{1}{2}x^2 + 2x - 2 + 6$$

$$y = -\frac{1}{2}x^2 + 2x + 4$$

#### **Opgave 42:**

de top is (-3,4)

$$y = a(x+3)^2 + 4 \text{ door } (-5,0)$$

$$0 = 4a + 4$$

$$-4a = 4$$

$$a = -1$$

$$y = -(x+3)^2 + 4$$

$$y = -(x^2 + 6x + 9) + 4$$

$$y = -x^2 - 6x - 9 + 4$$

$$y = -x^2 - 6x - 5$$

#### **Opgave 43:**

(0,3) en (5,3) liggen even hoog dus  $x_{top} = 2\frac{1}{2}$

dus de top is  $(2\frac{1}{2}, 5\frac{1}{2})$

$$y = a(x - 2\frac{1}{2})^2 + 5\frac{1}{2} \text{ door } (0,3)$$

$$3 = 6\frac{1}{4}a + 5\frac{1}{2}$$

$$-6\frac{1}{4}a = 2\frac{1}{2}$$

$$a = -\frac{2}{5}$$

$$y = -\frac{2}{5}(x - 2\frac{1}{2})^2 + 5\frac{1}{2}$$

$y(10) = -17$  dus ja het punt ligt op de parabool

**Opgave 44:**

de top is (2,4; 28,8)

$$h = a(t - 2,4)^2 + 28,8 \text{ door } (0,0)$$

$$0 = 5,76a + 28,8$$

$$-5,76a = 28,8$$

$$a = -5$$

$$h = -5(t - 2,4)^2 + 28,8$$

$$h = -5(t^2 - 4,8t + 5,76) + 28,8$$

$$h = -5t^2 + 24t - 28,8 + 28,8$$

$$h = -5t^2 + 24t$$

dus  $a = -5$  en  $b = 24$

**Opgave 45:**

de top is (15,9)

$$h = a(t - 15)^2 + 9 \text{ door } (0,0)$$

$$0 = 225a + 9$$

$$-225a = 9$$

$$a = -0,04$$

$$h = -0,04(t - 15)^2 + 9$$

$$h = -0,04(t^2 - 30t + 225) + 9$$

$$h = -0,04t^2 + 1,2t - 9 + 9$$

$$h = -0,04t^2 + 1,2t$$

dus  $a = -0,04$  en  $b = 1,2$