

## Diagnostische toets 3VWO1 hoofdstuk 5

### Opgave 1:

$$\begin{aligned}(a-3)^2 - (a+2)(a-2) &= \\ a^2 - 6a + 9 - (a^2 - 4) &= \\ a^2 - 6a + 9 - a^2 + 4 &= \\ -6a + 13 &= \end{aligned}$$

### Opgave 2:

$$\begin{aligned}A &= 12(p-1)^2 - 3(2p+1)(2p-1) + (4p)^2 = \\ 12(p^2 - 2p + 1) - 3(4p^2 - 1) + 16p^2 &= \\ 12p^2 - 24p + 12 - 12p^2 + 3 + 16p^2 &= \\ 16p^2 - 24p + 15 &= \end{aligned}$$

### Opgave 3:

a.  $(x+3y)(3-x+y) =$   
 $3x - x^2 + xy + 9y - 3xy + 3y^2 =$   
 $-x^2 + 3x - 2xy + 3y^2 + 9y$

b.  $(x+4)^3 =$   
 $(x+4)^2 \cdot (x+4) =$   
 $(x^2 + 8x + 16)(x+4) =$   
 $x^3 + 8x^2 + 16x + 4x^2 + 32x + 64 =$   
 $x^3 + 12x^2 + 48x + 64$

### Opgave 4:

a.  $64x^{20} : (2x)^5 = 64x^{20} : 32x^5 = 2x^{15}$

b.  $-6(x^3y^2)^2 + (2y)^4 \cdot x^6 = -6x^6y^4 + 16y^4x^6 = 10x^6y^4$

c.  $(2x^3 - 1)^2 = 4x^6 - 4x^3 + 1$

### Opgave 5:

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

b.  $N = \frac{p^2 + 10p + 25}{p^2 + 4p - 5} = \frac{(p+5)(p+5)}{(p+5)(p-1)} = \frac{p+5}{p-1}$

c.  $P = \frac{3}{a} + \frac{2}{3a^2} = \frac{9a}{3a^2} + \frac{2}{3a^2} = \frac{9a+2}{3a^2}$

### Opgave 6:

a.  $\frac{x-2}{x+3} - \frac{x}{x-2} = \frac{(x-2)(x-2)}{(x+3)(x-2)} - \frac{x(x+3)}{(x+3)(x-2)} = \frac{x^2 - 4x + 4 - x^2 - 3x}{(x+3)(x-2)} = \frac{-7x+4}{(x+3)(x-2)}$

b.  $\frac{a+2}{2a-2} : \frac{a+1}{a-1} = \frac{a+2}{2(a-1)} \cdot \frac{a-1}{a+1} = \frac{a+2}{2(a+1)}$

$$c. \quad \frac{a+1}{a^2+a} \cdot \frac{2a^2}{3} = \frac{a+1}{a(a+1)} \cdot \frac{2a^2}{3} = \frac{2a^2}{3a} = \frac{2}{3}a$$

**Opgave 7:**

$$a. \quad (3\sqrt{7})^2 - 7(\sqrt{6})^2 = 63 - 42 = 21$$

$$b. \quad 10\sqrt{2} - 11\sqrt{2} = -\sqrt{2}$$

$$c. \quad \frac{8\sqrt{21}}{6\sqrt{7}} = \frac{4}{3}\sqrt{3}$$

$$d. \quad \sqrt{5} \cdot 4\sqrt{3} - 2\sqrt{3} \cdot 3\sqrt{5} = 4\sqrt{15} - 6\sqrt{15} = -2\sqrt{15}$$

$$e. \quad 3\sqrt{7\frac{1}{9}} - (2\sqrt{2})^2 = 3\sqrt{\frac{64}{9}} - 8 = 3 \cdot \frac{8}{3} - 8 = 0$$

$$f. \quad \frac{4\sqrt{30}}{3\sqrt{10}} - \frac{\sqrt{15}}{3\sqrt{5}} = \frac{4}{3}\sqrt{3} - \frac{1}{3}\sqrt{3} = \sqrt{3}$$

**Opgave 8:**

$$a. \quad (2\sqrt{6} + 5\sqrt{3})^2 = (2\sqrt{6})^2 + 2 \cdot 2\sqrt{6} \cdot 5\sqrt{3} + (5\sqrt{3})^2 = 24 + 20\sqrt{18} + 75 = 99 + 20 \cdot 3\sqrt{2} = 99 + 60\sqrt{2}$$

$$b. \quad \sqrt{\frac{1}{6}} + \frac{5}{6}\sqrt{24} = \frac{1}{\sqrt{6}} + \frac{5}{6} \cdot 2\sqrt{6} = \frac{1}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} + \frac{5}{3}\sqrt{6} = \frac{1}{6}\sqrt{6} + \frac{5}{3}\sqrt{6} = 1\frac{5}{6}\sqrt{6}$$

$$c. \quad \sqrt{2\frac{2}{3}} = \sqrt{\frac{8}{3}} = \frac{\sqrt{8}}{\sqrt{3}} = \frac{2\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{6}}{3} = \frac{2}{3}\sqrt{6}$$

**Opgave 9:**

$$x^2 + 14x - 2 = (x+7)^2 - 49 - 2 = (x+7)^2 - 51$$

**Opgave 10:**

$$-100x^2 + 200x + 110 = -100(x^2 + 2x - 1,1) = -100((x-1)^2 - 1 - 1,1) = -100(x-1)^2 + 210$$