

Wiskunde voor vrijescholen

Antwoorden Klas 8

B.Geels

6 juli 2022

Stelsels vergelijkingen

- | | |
|--|--|
| <p>1-1 a. 1
b. 0
c. 0
d. -11</p> | <p>e. -9
f. $-\frac{1}{6}$
g. k.n.
h. 18</p> |
| <p>1-2 a. 0
b. $5\frac{2}{3}$
c. -3
d. -2</p> | <p>e. alle x-en zijn goed
f. 2
g. geen oplossing
h. 1</p> |
| <p>1-3 a. $\frac{3}{2}$
b. 0</p> | <p>c. -6
d. $-\frac{6}{7}$
e. $\frac{6}{5}$
f. 70</p> |
| <p>1-4 a. $\frac{3}{2}$
b. 1</p> | <p>c. 3
d. 0
e. 9
f. 15</p> |
| <p>1-5 a. 1
b. $-\frac{2}{3}$</p> | <p>c. 6
d. 5
e. -8
f. -4</p> |
| <p>1-6 a. -14
b. k.n.
c. $\frac{1}{6}$</p> | <p>d. -11
e. $-\frac{2}{7}$
f. alle x</p> |
| <p>1-7 a. k.n.
b. $2\frac{7}{15}$
c. $3\frac{1}{2}$</p> | <p>d. $1\frac{1}{5}$
e. $-1\frac{1}{2}$
f. 1</p> |
| <p>1-8 a. $2\frac{1}{4}$
b. $\frac{3}{4}$</p> | <p>c. $-\frac{1}{10}$
d. $\frac{1}{4}$
e. $-\frac{1}{3}$
f. $1\frac{3}{4}$</p> |
| <p>1-9 a. $\frac{3}{4}$
b. -2</p> | <p>c. $2\frac{1}{2}$
d. $\frac{3}{5}$
e. $\frac{3}{14}$
f. $-\frac{1}{10}$</p> |
| <p>1-10 a. 1
b. $-2\frac{3}{4}$</p> | <p>c. -4
d. 4
e. 0
f. -4</p> |
| <p>1-11 a. $-\frac{1}{3}$
b. k.n.</p> | <p>c. alle x
d. $-\frac{3}{5}$</p> |
| <p>1-12 a. $-\frac{3}{7}$
b. 0</p> | <p>c. 0
d. $-\frac{1}{12}$</p> |

1-13	a. $3\frac{1}{3}$	c. 10	e. -2
	b. $\frac{1}{2}$	d. geen opl.	f. $4\frac{1}{3}$
1-14	a. $2\frac{3}{4}$	c. $12\frac{3}{5}$	e. -1
	b. $2\frac{2}{3}$	d. $18\frac{1}{2}$	f. $33\frac{1}{3}$
1-15	a. $(-1, -\frac{1}{2})$	c. (6, 1)	e. $(1, \frac{1}{2})$
	b. (13, 6)	d. (-1, 2)	f. (3, 1)
1-16	a. (1, 2)	c. (4, -1)	e. (3, -1)
	b. $(-\frac{1}{2}, 7)$	d. (2, 4)	f. (-5, 7)
1-17	a. (4, 1)	c. $(2\frac{2}{3}, \frac{2}{3})$	e. (6, 7)
	b. (1, -1)	d. (15, 2)	f. (6, 5)
1-18	a. (0, 1)	c. (-1, 1)	e. (-1, 2)
	b. (2, 3)	d. (3, -4)	f. (10, 12)
1-19	a. (1, 4)	c. (2, 3)	e. (2, 3)
	b. (4, 1)	d. (7, 6)	f. (8, 7)
1-20	a. (-4, 8)	c. (11, -6)	e. (6, 2)
	b. (0, -2)	d. (1, 7)	f. $(0, -\frac{1}{3})$
1-21	a. (3, 4)	c. (1, 2)	e. (1, -2)
	b. (3, -4)	d. (5, -6)	f. (7, -8)
1-22	a. (0, 0)	c. (0, 1)	e. (2, 0)
	b. (1, 2)	d. (1, 10)	f. (2, 9)
1-23	a. $x = 4 - 5y$	c. $x = \frac{3}{4}y$	e. $x = 3y - 3$
	b. $x = 3 + 4y$	d. $x = \frac{1}{3}(5 - 7y)$	f. $x = 1\frac{2}{7} - \frac{1}{7}y$
1-24	a. $x = 4 - \frac{1}{2}y$	c. $x = 3 + \frac{1}{4}y$	e. $x = 1\frac{1}{2}y - 7\frac{1}{2}$
	b. $x = -\frac{3}{7} - \frac{3}{7}y$	d. $x = 1\frac{1}{3}y - 4$	f. $x = \frac{1}{9}(5y - 160)$
1-25	a. (5, 1)	c. (-2, 1)	e. $(\frac{1}{2}, 3)$
	b. (5, -4)	d. (0, 7)	f. (5, 8)
1-26	a. (-2, 1)	c. (1, 1)	e. (2, 1)
	b. (4, -3)	d. (0, 2)	f. (3, 1)
1-27	a. $(1, -\frac{1}{2})$	c. (1, -2)	e. (7, 2)
	b. (2, 1)	d. (1, 3)	f. (6, 0)

1-28	a. (5, 22)	c. (0, 7)	e. (1, 5)
	b. (2, 6)	d. (3, 7)	f. (0, 0)
1-29	a. $(\frac{1}{2}, 4)$	c. $(\frac{1}{3}, 3)$	e. $(\frac{1}{4}, 2)$
	b. $(\frac{1}{5}, 1)$	d. $(\frac{2}{3}, -6)$	f. $(\frac{3}{4}, -12)$
1-30	a. $(\frac{4}{5}, -20)$	c. $(\frac{5}{6}, -30)$	e. (1, 10)
	b. (10, 1)	d. (11, 100)	f. (1, 101)
1-31	a. strijdig	c. afhankelijk	e. (1; 3)
	b. strijdig	d. strijdig	f. $(\frac{1}{5}, -2)$
1-32	a. strijdig	c. (4; -2)	e. strijdig
	b. $(3\frac{1}{2}; \frac{1}{2})$	d. strijdig	f. (1, -5)
1-33	a. afh.	c. afh.	e. (3; -2)
	b. afh.	d. afh.	f. (1, -3)
1-34	a. (2, 1)	c. (4, -3)	e. (0, 2)
	b. strijdig	d. (0, 0)	f. (3, 0)
1-35	a. (8, 6)	c. (6, 1)	e. (-2, -2)
	b. afhankelijk	d. (4, -3)	f. (0, 2)
1-36	a. $(1, -\frac{1}{2})$	c. (1, -2)	e. (7, 2)
	b. (2, 1)	d. (6, 0)	f. (5, 22)
1-37	a. (6, 2)	c. (1, 7)	e. $(0, -\frac{1}{3})$
	b. (3, 4)	d. (-4, 8)	f. (11, -6)
1-38	a. (3, -1)	c. (-1, 2)	e. (1, -2)
	b. (7, 2)	d. (3, 1)	f. (4, 2)
1-39	a. (2, 4)	c. (0, -4)	e. (3, -1)
	b. $(-5, -4\frac{1}{4})$	d. (2, 0)	f. (17, -8)
1-40	a. $(-5\frac{1}{2}, -4)$	c. $(3, 1\frac{2}{3})$	e. afhankelijk
	b. (-1, -1)	d. (-6, 9)	f. $(-\frac{2}{9}, 1\frac{2}{3})$
1-41	a. (4, -1)	c. (3, -1)	e. (1, -6)
	b. (1, -2)	d. (1, -2)	f. (-3, -5)

1-42	-1, -3	1-63	20 liter
1-43	-19, -11	1-64	€10.000 en €15.000
1-44	-11, -5	1-65	€12.000 en €8.000
1-45	0, 40	1-66	€10.000 en €15.000
1-46	-2, -32	1-67	€1800 en €600
1-47	-15, $3\frac{1}{2}$	1-68	80
1-48	-116, 360	1-69	57
1-49	€100 en €50	1-70	95 m
1-50	$\frac{5}{12}$	1-71	20 km
1-51	48 en 72	1-72	6 en 12
1-52	17 en 43	1-73	40°, 50° en 90°
1-53	8 en 12	1-74	50°, 60° en 70°
1-54	8 en 16	1-75	6 en 10
1-55	6 en 12	1-76	15 en 9
1-56	25 en 30	1-77	onbepaald, b.v. 15 en 6
1-57	$\frac{4}{8}$	1-78	18
1-58	$\frac{6}{12}$	1-79	68
1-59	240 van 1 euro en 30 van 2 euro	1-80	$\frac{8}{13}$
1-60	36 en 9 jaar	1-81	4
1-61	50 cent	1-82	$\frac{4}{11}$
1-62	6 en 10	1-83	306
		1-84	€30; €18; €12

1-86 $\frac{1}{6}d + \frac{1}{12}d + \frac{1}{7}d + 5 + \frac{1}{2}d + 4 = d$

jeugd 14; baard 7; huwelijk 12; zoon 42; Diophantes 84

1-87 $\frac{3 \times 80}{5 + 3} = 30\text{ct per schotel}$ $5 \times 30 - 80 = 70$ en $3 \times 30 - 80 = 10$

1-88 $\frac{3 \times (14 + 16)}{7 + 8} = 6$ munten per schotel C krijgt: $7 \times 6 - 30 = 12$ munten;

S krijgt: $8 \times 6 - 30 = 18$ munten

1-89	a. $(1; \frac{1}{2}; 2)$	c. $(3; \frac{1}{3}; 4)$
	b. $(5; \frac{1}{4}; 6)$	d. $(7; \frac{1}{5}; 8)$
1-90	a. $(2; 3; 6)$	c. $(8; 0; 4)$
	b. $(5; 4; 3)$	d. $(3; 5; 4)$
1-91	a. $(1, -2, 3)$	c. $(2, -1, 4)$
	b. $(2, -1, 0)$	d. $(1, -2, 1)$

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|---|--|
| <p>1-92 a. $(\frac{1}{3}, 4, 5)$
b. $(6, 2, 2)$</p> <p>1-93 a. $(1; 1; 1)$
b. $(2; 2; -\frac{1}{3})$</p> <p>1-94 a. $(0; 1; 1)$
b. $(0; 1; 1)$</p> <p>1-95 a. $(-2; 2; 1)$
b. $(-4; 0; -4)$</p> <p>1-96 a. $(1; 2; 3)$
b. $(1; 2; 3)$</p> <p>1-97 a. $(-1; 2; -4)$
b. $(-3; 1; 0)$</p> <p>1-98 a. $(2; 1; 3)$
b. $(3; 0; 2)$ of $(-3; 0; -2)$</p> <p>1-99 a. $(6; 3; 2)$
b. $(5a; 4a; 3a)$</p> | <p>c. $(\frac{1}{2}, 10, -1)$
d. $(-1, 2, -3)$
c. $(1; 2; 2)$
d. $2; 1; 2)$
c. $(1; 0; 1)$
d. $(0; 0; 1)$
c. $(0; -3; 3)$
d. $(5; -5; 0)$
c. $(1; 2; 0)$
d. $(3; 2; 1)$
c. $(8; 4; 2)$
d. $(4; \frac{1}{2}; -7)$
c. $(3; 3; 1)$
d. $(1; 3; 5)$
c. $(a; b; c)$ of $(-a; -b; -c)$
d. $(bc; ac; ab)$</p> |
|---|--|

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|---|---|
| <p>1-100 1; 1; 1
1-101 1; 1; 3
1-102 3; 1; 1
1-103 32; 24; 4
1-104 15; 20; 35
1-105 842
1-106 4
1-107 2: 3
1-108 a. $(1; 2; 3; 4)$
1)
1-109 5; 5; 5; 4
1-110 $x = y - z - 3$
1-111 3; 4
1-112 2; 5
1-113 3; 2
1-114 1; 2
1-115 0; 3</p> | <p>1-116 -5; 6
1-117 8 : 3
1-118 $y = 2x - 3$
1-119 32; 28
1-120 $\frac{3}{4}$
1-121 55 en 25 jaar
1-122 $\frac{15}{20}$
1-123 48
1-124 25
1-125 19 en 11
1-126 28 en 38
1-127 25 en 9
1-128 6 en 11
1-129 7 en 15
1-130 15 en 45
1-131 12 en 48
1-132 13 en 17</p> |
|---|---|

- 1-133** 29 en 39
- 1-134** (8, 23)
- 1-135** 7 en 10

- 1-136** 12.000 en 18.000
- 1-137** 4000 en 6000
- 1-138** 250 en 500

- 2-1**
 - a. 137
 - b. 540
 - c. 100
 - d. 201

- 2-2**
 - a. 505
 - b. 84
 - c. 1266
 - d. 15

- 2-3**
 - a. 800
 - b. 299
 - c. 39
 - d. 113

- 2-4**
 - a. 644
 - b. 675
 - c. 196
 - d. 800

- 2-5**
 - a. 21026
 - b. 1611
 - c. 90
 - d. 146

- e. 106
- f. 144
- g. 14
- h. 68
- e. 7446
- f. 169
- g. 300
- h. 160
- e. 805
- f. 7961
- g. 1800
- h. 90
- e. 12
- f. 137
- g. 512
- h. 1170
- e. 771
- f. 75
- g. 1150
- h. 488

- 2-6**
- a. 6.699.984
 - b. 541
 - c. 475006
 - d. 66
 - e. 125
 - f. 1010100
 - g. 28200
 - h. 128

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|------------|---|--|
| 2-7 | <ul style="list-style-type: none"> a. 515 b. 75 c. 14620 d. 999 | <ul style="list-style-type: none"> e. 193 f. 133 g. 1470 h. 6250 |
|------------|---|--|

- 2-8**
- | | | | |
|----------------|----------------|----------------|--------------------------|
| a. $-15 - 10a$ | c. $-2a + 4b$ | e. $-3a - 12b$ | g. $-3a + 1\frac{1}{2}b$ |
| b. $-9a + 18b$ | d. $-12a + 18$ | f. $25 - 25a$ | h. $-3 - 15a$ |

- 2-9**
- | | | | |
|------------------|-----------------|--------------|-----------------|
| a. $-5a^2 + 5pq$ | c. $6a^2b - 6$ | e. $6c - 8d$ | g. $-4ab + 4pq$ |
| b. $-ab + 3pq$ | d. $5a^2 - 5bc$ | f. $5 + 20z$ | h. $-3 - 12z^2$ |

- 2-10**
- | | | | |
|--------------|-------------|--------------|--------------|
| a. $-3a + 3$ | c. $3 - 3a$ | e. $-3 - 9a$ | g. $3a - 3b$ |
| b. $-3a + 6$ | d. $a - b$ | f. $9a + 3$ | h. $9a - 3$ |

- 2-11**
- | | | | |
|----------------|------------------------------------|-----------------|---------------|
| a. $4a^2 + 12$ | c. $-\frac{1}{2}a^2 + \frac{1}{3}$ | e. $3a - 18b^2$ | g. $-a - b$ |
| b. $-2a + 2b$ | d. $3a^2 + 6b^2$ | f. $4a - 8b$ | h. $-4a + 8b$ |

- 2-12**
- | | | | |
|---------------------|---------------------|------------------------|----------------|
| a. $4a + 8b^2 + 4c$ | c. $21c + 3z - 3$ | e. $-a + \frac{1}{2}c$ | g. $-6a + 12c$ |
| b. $5p + 5q - 25$ | d. $-7a - 42b + 21$ | f. $4 + 8c - 12d$ | h. $12a - 6$ |

- 2-13**
- | | | | |
|----------------|------------------|----------------|----------------|
| a. $ap + aq$ | c. $ap - aq$ | e. $2a^2 + aq$ | g. $2ap - aq$ |
| b. $2ap + 3aq$ | d. $-2p^2 + 3aq$ | f. $2a + 3ac$ | h. $-3a + 2ac$ |

2-14

- a. $2a - 6ac$
- b. $3ac - 6cd$
- c. $4az - 8bz$
- d. $-4kp + 12kq^2$

- e. $15a^2 + 10ad^2$
- f. $6ad - 15d^3$
- g. $3az + 6z^2$
- h. $-8kp - 20kz$

2-15

- a. $4ab - 6abc$
- b. $-8xy + 4x^3y$
- c. $8a^2b - 10aby$
- d. $-2x^2yz^2 + 3x^2y$

- e. $-3bcx + 6bcy$
- f. $-6x^2 + 12tx^2$
- g. $a^2bc - 3a^2bd$
- h. $-2x^2yz^2 - 3x^3y$

2-16

- a. $2a + 4ab + 6ac$
- b. $a^2 - 2a^2b + 3a^2c$
- c. $xy^2 - 3x^2y^2 + 4y^2$
- d. $-ab + abc + abd$

- e. $a - 2ap - 3aq$
- f. $xy^2 - 3x^2y^2 + 4y^2$
- g. $x^2z^2 + y^2z^2$
- h. $9xy + 9xz - 9x$

2-17

- a. $3(x + 2)$
- b. $4(4a - 5b)$
- c. $3(x + 4)$
- d. $16(a - 1)$

- e. $3(x + 1)$
- f. $8(-a + 3)$
- g. $3(2a + 3b)$
- h. $6(-a + 4)$

2-18

- a. $25x(c - y)$
- b. $20x(5y - 1)$
- c. $20(5x - y)$
- d. $3xy(-2z + 1)$

- e. $25y(c - x)$
- f. $2p(9q + 16y)$
- g. $3xy(z - 2)$
- h. $22xy(2z - 3t)$

2-19

- a. $x(x + 3)$
- b. $3x(x - 2)$
- c. $3x(2x - 1)$
- d. $2x^2(2x + 1)$

- e. $x(x - 6)$
- f. $3x(-2x + 1)$
- g. $3(2x^2 - 1)$
- h. $5x(x - 2)$

2-20

- a. $8(x + y)$
- b. $9x^2y^2(x + 3y)$
- c. $10xy(16x + 15y^2)$
- d. $2x^2(4x^2 + 4x + 3y)$

- e. $7c^2d(-3c + 2d)$
- f. $9x^2y(2y^2 + 3)$
- g. $3x^2(2x - 3y + 1)$
- h. $4x^7y^3(-2x + z)$

2-21

a.	$ab + ad + bc + cd$	c.	$ap + aq + bp + bq$	e.	$ce + cf + de + df$
b.	$3a + ac + 3b + bc$	d.	$ab + ac + 3b + 3c$	f.	$3a + ad + 3b + bd$

2-22

a.	$x^2 + x - 6$	c.	$x^2 + 6x + 5$	e.	$x^2 + 7x + 6$
b.	$p^2 + 5p + 6$	d.	$p^2 - 3p + 2$	f.	$y^2 + 10y + 21$

2-23

a.	$6pt + 4pv + 3qt + 2v^2$	c.	$6pt + 4p - 3qt - 2q$	e.	$y^2 - 6y - 16$
b.	$k^2 + 6k + 5$	d.	$2ac + 2ad + bc + bd$	f.	$4ac + 2ad + 2bc + bd$

2-24

a.	$10ab + 15a + 8b + 12$	c.	$4ax - 8bx + ay - 2by$	e.	$4xy - 4xz - 4y + 4z$
b.	$6 + 17a + 12a^2$	d.	$-6a^2 - a + 1$	f.	$4p + 2pt + 12t + 6t^2$

2-25

a.	$(x + 2)(x + 3)$	c.	$(x + 1)(x + 4)$	e.	$(x + 1)(x + 6)$
b.	$(x + 2)(x + 4)$	d.	$(x + 8)(x + 1)$	f.	$(x + 2)(x + 6)$

2-26

a.	$(x - 2)(x - 7)$	c.	$(x - 1)(x - 14)$	e.	$(x - 1)^2$
b.	$(a - 3)(a - 5)$	d.	$(a - 1)(a - 15)$	f.	$(a - 1)(a - 18)$

2-27

a.	$(x - 10)(x + 3)$	c.	$(x + 10)(x - 3)$	e.	$(x - 15)(x + 2)$
b.	$(x + 15)(x - 2)$	d.	$(x - 6)(x + 5)$	f.	$(x - 30)(x + 1)$

2-28

a.	$(x + 3)(x + 4)$	c.	$(x + 12)(x + 1)$	e.	$(x - 2)(x - 9)$
b.	$(x - 3)(x - 6)$	d.	$(x + 30)(x - 1)$	f.	$(x - 8)(x + 2)$

2-29

a.	$(x + 9)(x - 4)$	c.	$(x - 6)(x + 3)$	e.	$(x - 3)(x - 7)$
b.	$(x - 9)(x + 8)$	d.	$(x - 1)(x - 6)$	f.	$(x - 5)(x - 6)$

2-30

a.	$(x - 5)^2$	c.	$(x + 5)^2$	e.	$(x - 3)(x - 5)$
b.	$(x - 7)(x - 5)$	d.	$(x + 7)^2$	f.	$(x - 9)(x + 6)$

2-31

a.	$x^2 + 10x + 25$	c.	$x^2 + 20x + 100$	e.	$4x^2 - 16x + 16$
b.	$x^2 - 10x + 25$	d.	$x^2 - 25$	f.	$4x^2 - 36$

2-32

a.	$a^2 + 2ab + b^2$	c.	$p^2 + 2pq + q^2$	e.	$144 + 24q + q^2$	g.	$p^2 + 8q + 16$
b.	$a^2 + 8a + 16$	d.	$9 + 6q + q^2$	f.	$a^2 + \frac{2}{3}a + \frac{1}{9}$	h.	$a^2 + 6a + 9$

2-33

a.	$x^2 + 2x + 1$	c.	$x^2 + 20x + 100$	e.	$x^2 + 22x + 121$	g.	$y^2 + 14y + 49$
b.	$z^2 + 18z + 81$	d.	$z^2 + 18z + 81$	f.	$y^2 + 6y + 9$	h.	$t^2 + 16t + 64$

2-34 a $x^2 - 4xy + 4y^2$ | c $4x^2 - 4xy + y^2$ | e $4x^2 - 24x + 36$ | g $4y^2 - 4xy + x^2$
 b $4x^2 - 4x + 1$ | d $4x^2 - 8x + 4$ | f $4x^2 - 12x + 9$ | h $9x^2 - 18x + 9$

2-35
 a $9x^2 - 6x + 1$ | c $9x^2 - 6x + 1$ | e $16x^2 - 40xy + 25y^2$ | g $16x^2 - 24xy + 9y^2$
 b $4y^2 - 20xy + 25x^2$ | d $9x^2 - 60x + 100$ | f $x^2 - 6xy + 9y^2$ | h $x^4 - 4x^2 + 4$

2-36
 a $4x^2 - 12x + 9$ | c $16x^2 + 40x + 25$ | e $x^2 - 6y + 9y^2$ | g $\frac{1}{9}x^2 + \frac{14}{3}x + 49$
 b $0,01 + 0,2y + y^2$ | d $12\frac{1}{4}$ | f 10201 | h $x^2 - \frac{4}{3}xy + \frac{4}{9}y^2$

2-37 a. $(a + b)^2$ | c. $(a + 2b)^2$ | e. $(a + 5b)^2$
 b. $(a + 5)^2$ | d. $(a + 6)^2$ | f. $(x + 4)^2$

2-38 a. $(x + 4y)^2$ | c. $(x - 4y)^2$ | e. $(y + 3)^2$
 b. $(y + 5)^2$ | d. $(8 + x)^2$ | f. $(x - 1)^2$

2-39 a. $(x + 2y)^2$ | c. $(7 - x)^2$ | e. $(p + 15q)^2$
 b. $(4a + 1)^2$ | d. $(3x - y)^2$ | f. $(2x + 5y)^2$

2-40 a. $(2x - 5y)^2$ | c. $(2x - 3y)^2$ | e. $(2x + 7y)^2$
 b. $(3a - 5b)^2$ | d. $(3a + 4c)^2$ | f. $(11x + 1)^2$

2-41 a. $(4 - 5t)^2$ | c. $(2x + 3y)^2$ | e. $(2 - 3y)^2$
 b. $(12a - 1)^2$ | d. $(9x - 7)^2$ | f. $(a^2 + 1)^2$

2-42 a. ja | c. nee, $25 \neq 2 \times 12$ | e. nee | g. ja
 b. nee, -36 | d. ja | f. ja | h. ja

2-43 a. $2\frac{1}{4}$ | c. $110\frac{1}{4}$ | e. 56, 25
 b. 20, 25 | d. $12\frac{1}{4}$ | f. $90\frac{1}{4}$

2-44 a. $a^2 - 4$ | c. $a^2 - 36$ | e. $a^2 - 36$
 b. $36 - a^2$ | d. $x^2 - 1$ | f. $1 - x^2$

2-45 a. $x^2 - y^2$ | c. $a^2 - 49$ | e. $a^2 - \frac{1}{4}$
 b. $-a^2 + 9$ | d. $-b^2 + 25$ | f. $t^2 - 64$

2-46 a. $t^2 - 100$ | c. $v^2 - w^2$ | e. $c^2 - d^2$
 b. $k^2 - 100$ | d. $9a^2 - b^2$ | f. $25x^2 - y^2$

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|------|-------------------------|-----------------------------------|----------------------------|-----------------------------|
| 2-47 | a. $4a^2 - 9$ | c. $4a^2 - 16$ | e. $4a^2 - 1$ | |
| | b. $9a^2 - 4$ | d. $25a^2 - 49$ | f. $-25a^2 + 81$ | |
| 2-48 | a. $a^2 - 4b^2$ | c. $-4b^2 + 9$ | e. $-4b^2 + 1$ | |
| | b. $36a^2 - 25$ | d. $-49y^2 + 1$ | f. $36a^2 - 25y^2$ | |
| 2-49 | a. $4x^2 - 9y^2$ | c. $-4t^2 + 16z^2$ | e. $64x^2 - 9y^2$ | |
| | b. $25a^2 - 9b^2$ | d. $x^4 - 16$ | f. $x^4 - 1$ | |
| 2-50 | a. $-x^2y^2 + 1$ | c. $9t^2 - y^4$ | e. $-x^4 + 64$ | |
| | b. $-x^4 + 9$ | d. $a^2b^2 - c^2d^2$ | f. $4a^2 - c^2d^2$ | |
| 2-51 | a. $x^4 - y^2$ | d. $x^4 - 4y^2$ | | |
| | b. $x^6 - y^2$ | e. $x^6 - 25y^2$ | | |
| | c. $a^2b^4 - a^4b^2$ | f. $-9q^6 + p^2q^4$ | | |
| 2-52 | a. $a^4 - b^4$ | c. $\frac{1}{9}a^6 - \frac{1}{4}$ | e. $25a^8 - 16$ | |
| | b. $a^6 - 1$ | d. $a^4 - a^2b^2$ | f. $x^{16} - \frac{1}{16}$ | |
| 2-53 | a. $a^2 - 16$ | c. $x^2 - 4$ | e. $x^6 - 9$ | |
| | b. $-a^4 + 25$ | d. $-x^2 + 1$ | f. $400 - 1 = 399$ | |
| 2-54 | a. $35\frac{3}{4}$ | c. $24,96$ | e. $8\frac{77}{81}$ | |
| | b. $8\frac{7}{16}$ | d. 384 | f. 224 | |
| 2-55 | a. 896 | c. 9999 | e. 999900 | |
| | b. 399 | d. 255 | f. 80 | |
| 2-56 | a. $8\frac{15}{16}$ | c. $102\frac{19}{81}$ | e. $99\frac{3}{4}$ | |
| | b. 9801 | d. $27\frac{1}{25}$ | f. 624 | |
| 2-57 | a. $79\frac{1}{81}$ | c. $34\frac{1}{36}$ | e. $35\frac{21}{25}$ | |
| | b. 399 | d. $8\frac{15}{16}$ | f. $23\frac{1}{25}$ | |
| 2-58 | a. 1521 | c. 896 | e. $30\frac{1}{4}$ | g. $38\frac{1}{36}$ |
| | b. $23\frac{1}{25}$ | d. 9999 | f. 10201 | h. 2496 |
| 2-59 | a. $123\frac{1}{121}$ | c. $29\frac{4}{25}$ | e. 4899 | g. $72\frac{1}{4}$ |
| | b. $171\frac{1}{169}$ | d. $119\frac{1}{121}$ | f. $3.999.996$ | h. $898\frac{1}{900}$ |
| 2-60 | a. $(x + y)(x - y)$ | c. $(2x + y)(2x - y)$ | e. $3x + 2y)(3x - 2y)$ | g. $(x^2 + y^3)(x^2 - y^3)$ |
| | b. $(2a + 4b)(2a - 4b)$ | d. $3(x + 1)(x - 1)$ | f. $x + 18)(x - 18)$ | h. $(a + bc)(a - bc)$ |

2-61

a. $(x - \frac{1}{2})(x + \frac{1}{2})$	c. $(x^2 + \frac{1}{4})(x^2 - \frac{1}{4})$	e. $(\frac{1}{2}a + b)(\frac{1}{2}a - b)$
b. $(\frac{x}{a} + 1)(\frac{x}{a} - 1)$	d. $(\frac{x^3}{4} + \frac{1}{2})(\frac{x^3}{4} - \frac{1}{2})$	f. $(p^2 + \frac{1}{2}q)(p^2 - \frac{1}{2}q)$

2-62

a. $3x(x - 2)$	c. $3(x + 1)(x - 1)$	e. $(p + 2q)(p + 5q)$	g. $4(a + 2b)(a - 2b)$
b. $(3x - 1)^2$	d. $(c + 5)(c - 10)$	f. $7(x^2 + 7)$	h. $4(x^2 + 9)$

2-63

a. $x(x + 1)(x - 1)$	c. $x^2(x - 1)$	e. $x(x - 2)(x + 1)$	g. $(y + 2x)^2$
b. $y^2(x + 2)(x - 2)$	d. $3(a + 5)(a - 1)$	f. $xy^2(y - 1)(y + 1)$	h. $(t - 10)(t + 4)$

2-64

a. $3x^2y(1 - 3xy)$	c. $2(2 - z)(2 + z)$	e. $3(x + 1)(x + 2)$	g. $(x + 3)^2$
b. $(x + 11)(x - 5)$	d. $6a(1 - b)$	f. $6a(1 - b)(1 + b)$	h. $3(x - 1)^2$

2-65

a. $x^2y^2 + 2abxy + a^2b^2$	c. $9x^2y^2 - 24x^2yz + 16x^2z^2$	e. $9x^2y^2 - 24x^2y + 16x^2$	g. $16x^2 + 2x^2y + \frac{1}{16}x^2y^2$
b. $9x^4 - 2x^2 + \frac{1}{9}$	d. $a^6 - 2a^4b + a^2b^2$	f. $x^6 - 2x^3y^3 + y^6$	h. $4x^8 + 2x^6 + \frac{1}{4}x^4$

2-66

a. $x^6 - 0,01x^2$	e. $\frac{1}{9}x^2y^6 - z^8$
b. $a^{2n} - 1$	f. $a^{6n} - 9$
c. $a^{2n-2} - 4$	g. $a^{2n} - b^{2m}$
d. $9a^{2n} - a^4$	h. $25a^{2p} - p^2a^{10}$

2-67

a. $\frac{1}{4}a^4 + \frac{1}{2}a^3b + \frac{1}{4}a^2b^2$	c. $x^3 + 2x + \frac{1}{x}$	e. $x^2 - 2 + \frac{1}{x^2}$	g. $x^4 + 2x^2 + 1$
b. $\frac{1}{x} - 2 + x$	d. $\frac{1}{x^2} + \frac{2}{xy} + \frac{1}{y^2}$	f. $\frac{4}{x^2} - \frac{12}{xy} + \frac{9}{y^2}$	h. $\frac{a^2}{b^2} + 2 + \frac{b^2}{a^2}$

2-68 a $x^4 - y^2$

b $\frac{1}{y^2} - 1$

c $x^4 - \frac{1}{4}x^2$

d $-\frac{1}{x^2} + 1$

2-69 a. $x^4 - 18x^2 + 81$

b. $x^4 - 2x^2 + 1$

c. $81x^4 - 18x^2 + 1$

d. $\frac{16}{81} - x^4$

2-70

a. $(a + 3)^2$

b. $(y + 6)(y + 4)$

c. $(3p - 2)^2$

d. $(4x + 1)^2$

e $-\frac{1}{9} + y^6$

f $6\frac{1}{4}x^2 - 12\frac{1}{4}$

g $\frac{3}{a^2} - 3$

h $-x^2 + \frac{1}{x^2}$

e. $x^4 - 1$

f. $16x^4 - 256$

g. $16x^4 - 392x^2 + 2401$

h. $(x^4 + 1)(x^4 - 1) = x^8 - 1$

2-71

a. $(x + 0, 1)^2$

b. $(1\frac{3}{7}x + 2\frac{4}{5})^2$

c. $(15 - b)^2$

d. $(x^4 - 14)(x^4 + 14)$

e. $(30x^3 + 17y^2)(30x^3 - 17y^2)$

f. $(y + 0, 5x)(y - 0, 5x)$

2-72

a. $9a^2 - 49$

b. $12\frac{1}{4}c^8 - 4\frac{76}{81}$

c. $x^6 - 1$

d. $28\frac{4}{9}x^{10} - 4x + \frac{9}{64}\frac{1}{x^4}$

2-73

a. $(4p - 7q)(4p + 7q)$

b. $(2y + 5)^2$

c. $(\frac{1}{10}k + \frac{1}{3})(\frac{1}{10}k - \frac{1}{3})$

d. $2(4x - y)^2$

e. $(\frac{4}{15} + 1\frac{9}{11}p)(\frac{4}{15} - 1\frac{9}{11}p)$

f. $(\frac{1}{5}a + 11b)(\frac{1}{5}a - 11b)$

2-74

a. $(\frac{1}{2}a + 30)(\frac{1}{2}a - 30)$

b. $(3y - 10)^2$

c. $(14c + 9)(14c - 9)$

d. $(11c + 12)(11c - 12)$

e. $(2x + 7y)^2$

f. $(x^4 + 100)(x^2 + 10)(x^2 - 10)$

2-75

a. $2(\frac{1}{2}y + \frac{1}{4}x)(\frac{1}{2}y - \frac{1}{4}x)$

b. $(3\frac{1}{2}x - 5)^2$

c. $(x + 0, 1)^2$

d. $(x + 4)(x - 7)$

e. $(15 - \frac{1}{30}b)^2$

f. $(x + 6)(x - 5)$

2-76

a.	$(1\frac{1}{3}y + 2\frac{1}{7}p)(1\frac{1}{3}y - 2\frac{1}{7}p)$	c.	$(x + 6)(x - 7)$	e.	$(x + 11)(x - 13)$
b.	$(x - 9)^2$	d.	$(x + 16)^2$	f.	$(x + 4)(x - 5)$

2-77

a.	$16y^2 + 144xy + 324x^2$	c.	$144a^2 - 12a + \frac{1}{4}$	e.	$x^2 + 4x - 77$
b.	$4a^2 + 52ab + 169b^2$	d.	$16a^2 - 225$	f.	$x^2 - 5x^2 - 104$

2-78

a.	$16a^2x^2 - 8axy + y^2$	c.	$\frac{a^2}{4} - \frac{9}{b^2}$	e.	$9y^2 - x^2$
b.	$144x^3 - 144x^2y + 36xy^2$	d.	$-x^2 + 9y^2$	f.	$\frac{a^2}{b^2} + 2 + \frac{b^2}{a^2}$

2-79

a.	$(x + 10)(x + 21)$	c.	$(x - 60)(x + 6)$	e.	$(x - 8)(x + 45)$
b.	$(x - 40)(x - 9)$	d.	$-(x - 4)(x + 41)$	f.	$-(x - 36)(x + 25)$

2-80

a.	$(xy + 8z)^2$	c.	$\frac{1}{2}(x - y)^2$	e.	$(\frac{1}{2}x - 2z)^2$
b.	$(x^2 - 1)(x^2 - 9)$	d.	$(\frac{1}{4}y^2 + t^2)^2$	f.	$a^3(a^2 + 1)$

2-82

a.	$7\frac{1}{2}(x + 1)^2$	c.	$(x^2 - 2)^2$	e.	$(x^2 - 4x)^2$
b.	$(x^2 - 3)^2$	d.	$(x + 1)^2(x - 9)^2$	f.	$(x + 3)^2(x - 3)^2$

2-83

a.	$(x^4 + y^3)(x^4 - y^3)$	c.	$(x^4 + 2y^3)(x^4 - 2y^3)$	e.	$(4x^4 + y^2)(2x^2 + y)(2x^2 - y)$
b.	$(\frac{1}{4}x^4 + y^2)(\frac{1}{2}x^2 + y)(\frac{1}{2}x^2 - y)$	d.	$(\frac{1}{4}x^4 + 9y^2)(\frac{1}{2}x^2 + 3y)(\frac{1}{2}x^2 - 3y)$	f.	$2(x^8 + 4)$

2-84

a.	$(\frac{1}{8}x^2 + y^2)(\frac{1}{8}x^2 - y^2)$	c.	$z^5(z + 1)(z - 1)$	e.	$z^3(z^2 + 1)(z + 1)(z - 1)$
b.	$\frac{1}{2}(x + 3z)(x - 3z)$	d.	$\frac{1}{2}(x^2 + 9)(x + 3)(x - 3)$	f.	$(\frac{1}{x} + \frac{1}{y})(\frac{1}{x} - \frac{1}{y})$

2-85

a.	$2(x^2 + 1)(x + 1)(x - 1)$	c.	$(y^2 + 4)(y + 2)(y - 2)$	e.	$(\frac{1}{3} + \frac{1}{z})(\frac{1}{3} - \frac{1}{z})$
b.	$(\frac{1}{4} + \frac{1}{x})(\frac{1}{4} - \frac{1}{x})$	d.	$a(a + b)(a - b)$	f.	$b(2b + 3c)(2b - 3c)$

2-86

a. $2(2a + 5)(2a - 5)$	c. $ab(3a + 5b)(3a - 5b)$	e. $(7a + 10a^2)(7a - 10a^2)$
b. $2b(10a + 7b^2)(10a - 7b^2)$	d. $5(a + b)^2$	f. $a(a - b)^2$

2-87

a. $(x + 6)(x - 5)$	c. $(3x + y)^2$	e. $(x - 6)^2$
b. $(2ab - 3c)^2$	d. $(x + 15)(x - 2)$	f. $(12y - 7px)(12y + 7px)$

2-88

a. $3ab(a + b)^2$	e. $5a^2b(2a - b)^2$
b. $2(a - 2b)(a - 3b)$	f. $a(a + 2b)(a - 12b)$
c. $2ab(a + b)(a - 10b)$	g. $3ab(b + 4c)(b - c)$
d. $2a(a^3 - 27b^3)$	h. $2ab(125b^3 + 64c^3)$

2-89

a. $4a^2 + 12ab + 9b^2 - c^2$	e. $9a^2 - 12ab + 4b^2 - 16c^2$
b. $9x^2 + 12xy + 4y^2 - z^2$	f. $4x^2 - 12xy + 9y^2 - 25z^2$
c. $25a^2 - 20ab + 4b^2 - 16c^2$	g. $36a^2 - 36ab + 9b^2 - 16c^2$
d. $25x^2 + 20xy + 4y^2 - 36z^2$	h. $25x^2 + 20xy + 4y^2 - 9z^2$

2-90

a. $9a^2 - 9b^2 - 30ac + 25c^2$	c. $100a^2 - 4b^2 + 4bc - c^2$
b. $9x^2 + 6xz - 16y^2 + z^2$	d. $64x^2 - 48xz - 25y^2 + 9z^2$

2-91 $(x - 3)^2 - 9 = x^2 - 6x + 8 = (x - 2)(x - 4)$

2-92

a. -8	e. 21
b. -9	f. -33
c. -57	g. -22
d. -31	h. -42

2-93

a. -2	e. $-2\frac{3}{5}$
b. 3	f. -62
c. -9	g. $10\frac{2}{9}$
d. -15	h. -119

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|---|--|--|---|---|--|---|--|--|--|---|---|--|--|--|---|--|--|
| <p>2-94</p> <p>a. $-7\frac{4}{5}$</p> <p>b. 111</p> <p>c. -57</p> <p>d. 54</p> | <p>2-95</p> <p>a. -42</p> <p>b. -68</p> <p>c. 42</p> <p>d. -56</p> | <p>2-96</p> <p>a. a</p> <p>b. $4\frac{1}{6}$</p> | <p>2-97</p> <p>a. $\frac{a}{b}$</p> <p>b. 6</p> | <p>c. $1\frac{1}{2}$</p> <p>d. 4</p> <p>e. $6b$</p> <p>f. $\frac{4q}{p}$</p> | <p>e. 35</p> <p>f. 2</p> <p>g. 9</p> <p>h. -141</p> | <p>2-98</p> <p>a. 4</p> <p>b. $\frac{1}{2}$</p> | <p>2-99</p> <p>a. $4x$</p> <p>b. $9c$</p> | <p>2-100</p> <p>a. $\frac{3a}{4x}$</p> <p>b. $-\frac{7}{x^2}$</p> | <p>c. 30</p> <p>d. $6c$</p> <p>e. 5</p> <p>f. $\frac{c}{6}$</p> <p>g. 1</p> <p>h. $\frac{1}{6}$</p> | <p>2-101</p> <p>a. $\frac{x+3}{x+2}$</p> <p>b. $\frac{x+5}{x-3}$</p> | <p>2-102</p> <p>a. $\frac{x+3}{x-5}$</p> <p>b. $\frac{x-2}{x-2}$</p> | <p>c. $2k$</p> <p>d. -5</p> <p>e. $5d^2$</p> <p>f. $-11k$</p> <p>g. $\frac{1}{2}a^2$</p> <p>h. $-\frac{3m}{n}$</p> | <p>2-103</p> <p>a. $\frac{2p}{3}$</p> <p>b. $\frac{p}{2}$</p> | <p>c. $-\frac{2p}{3}$</p> <p>d. $-4z^2$</p> <p>e. $-\frac{5b}{3a}$</p> <p>f. $-\frac{4b^2}{5a}$</p> <p>g. $-\frac{yz}{4}$</p> <p>h. $\frac{py}{3}$</p> | <p>e. $5x$</p> <p>f. $\frac{1}{4}$</p> <p>g. $1\frac{3}{7}x$</p> <p>f. 4</p> <p>g. $2y$</p> <p>h. 7</p> <p>g. 2</p> <p>h. $7m$</p> | <p>c. $\frac{x-4}{x+1}$</p> <p>d. $\frac{x+4}{x-2}$</p> <p>e. $\frac{x+2}{x-3}$</p> <p>f. $\frac{x+1}{x-1}$</p> <p>g. $\frac{x+3}{x+1}$</p> <p>h. $\frac{xy^2}{3}$</p> | <p>c. $\frac{p}{3}$</p> <p>d. xy</p> <p>e. $\frac{5p}{4}$</p> <p>f. $\frac{2k^2}{5}$</p> <p>g. $2p$</p> <p>h. $\frac{xy^2}{2}$</p> |
|---|--|--|---|---|--|---|--|--|--|---|---|--|--|--|---|--|--|

2-104

a. $\frac{1}{x}$

b. $\frac{2a^2+2b^2}{5b}$

c. $\frac{4+3a}{x}$

d. $\frac{c^2}{b}$

e. $\frac{a+b}{4}$

f. $\frac{1}{ap}$

g. $\frac{a+b}{x}$

h. $\frac{1+2q}{3ap}$

2-105

a. $\frac{a^2+15}{3a}$

b. $\frac{b^2+4a}{4b}$

c. $\frac{p^2+3q}{pq}$

d. $\frac{a^2+b^2}{ab}$

e. $\frac{5x+xy}{3y}$

f. $\frac{4b^2+3c^2}{2bc}$

g. $\frac{4k^2+10m}{5k}$

h. $\frac{d^2+15e^2}{5de}$

2-106

a. $\frac{a+5}{5}$

b. $\frac{6-b}{3}$

c. $\frac{a-5}{5}$

d. $\frac{b-2a}{b}$

e. $\frac{b+27}{9}$

f. $\frac{3d+2c}{d}$

g. $\frac{2b+3d}{d}$

h. $\frac{2q-p}{q}$

2-107

a. $\frac{85b+33a}{15ab}$

b. $-\frac{q}{6p^2}$

c. $\frac{2a-4b}{a^2b}$

d. $\frac{6k^2+5m}{km^2}$

e. $\frac{4xy-15}{3y^2}$

f. $\frac{-3q^2-5pq}{p^2}$

g. $\frac{18m^2-10n^2}{15mn}$

h. $\frac{ab^2-a}{bc}$

2-108

a. $\frac{4t+5p}{6pqt}$

b. $\frac{ay+5x}{xy^2}$

c. $\frac{4t^2-5q}{6pqt}$

d. $\frac{10y-ax}{2xy^2}$

e. $\frac{3b+4a}{a^2b^2}$

f. $\frac{15x^2-2cd}{6cdx}$

g. $\frac{3c^4+2ab^2}{a^2bc^3}$

h. $\frac{2c+3a}{2abc}$

2-109

a. $\frac{5}{a+b}$

b. $\frac{a+b}{a^2+b^2}$

c. 1

d. $\frac{8}{3+x}$

e. $\frac{a-5}{a^2+b^2}$

f. 3

g. $\frac{3+2y}{3+y}$

h. 1

2-110

a. $\frac{4a^2}{b}$

b. $-4y$

c. $\frac{a}{6}$

d. $3q$

e. $\frac{p+q}{5}$

f. $\frac{3-4mt}{m^2}$

g. $\frac{3-2b}{3}$

h. $\frac{a^2-bc}{ac}$

2-111

a. $\frac{ac}{bd}$

b. $\frac{8px}{3qy}$

c. $-\frac{ac}{bd}$

d. $\frac{9q}{2xy}$

e. $-\frac{ac}{bd}$

f. $\frac{16tx}{15yz}$

g. $\frac{6ac}{5bd}$

h. $-\frac{3abd}{cpq}$

2-112

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

b. $\frac{1}{2}$

c. 3

d. 2

e. -3

f. $-2a$

g. 1

h. $-\frac{1}{4}$

2-113	a. $\frac{a+b}{a}$	e. $\frac{a^2+ab}{4}$
	b. $\frac{a^2+ab}{2}$	f. $\frac{1}{2}a$
	c. $\frac{(a+b)^2}{6}$	g. $\frac{a+b}{3}$
	d. $\frac{a}{2}$	h. $\frac{a+b}{5}$

2-114	a. $-\frac{1}{a}$	c. $\frac{a}{4}$	e. $\frac{9a}{c}$	g. $-\frac{1}{3}$
	b. $\frac{e}{14d}$	d. 6	f. $\frac{4a}{3dq}$	h. $-\frac{2p}{9}$

2-115	a. a	c. $\frac{1}{a}$	e. $\frac{2}{a}$	g. 2a
	b. -3a	d. 3	f. 1	h. -1

2-116	a. b	c. 3b	e. b ²	g. ab
	b. -3ab ²	d. -3a ² b	f. -b	h. -1

2-117	a. -2x ³ y	c. $\frac{-4}{x^2}$	e. $-\frac{a}{pq}$
	b. $\frac{1}{q^2}$	d. -kx ²	f. $\frac{m}{a}$

2-118	a. $\frac{2}{3}$	c. 6	e. $\frac{5}{6}$	g. $\frac{1}{4}$
	b. 1	d. 3	f. -1	h. 1

2-119	a. $\frac{2}{3}$	c. 4 $\frac{1}{2}$	e. $-\frac{3}{7}$	g. $\frac{3}{5}$
	b. $\frac{3}{4}$	d. -1 $\frac{1}{2}$	f. $-\frac{2}{9}$	h. -1 $\frac{4}{5}$

2-120	a. $\frac{1}{3}$	c. 9	e. -3 $\frac{3}{4}$	g. 1 $\frac{1}{8}$
	b. $\frac{3}{8}$	d. -2	f. 7 $\frac{1}{2}$	h. $-\frac{15}{64}$

2-121	a. $\frac{1}{x}$	c. 4a ²	e. 4	g. $\frac{1}{4}$
	b. 3ab	d. $\frac{3a^5}{b}$	f. -a ⁴	h. -9a ²

2-122	a. $\frac{1}{2}x$	c. $\frac{6x}{y}$	e. $-\frac{m}{n}$	g. $-\frac{n}{m}$
	b. $\frac{4x^2}{9y^2}$	d. 1	f. $\frac{x}{4y}$	h. $\frac{3pxz}{2}$

2-123

a. $\frac{a}{a+b}$
 b. $\frac{a}{a+b}$
 c. $-\frac{1}{2}$
 d. $-\frac{3}{a+b}$

e. $\frac{a+b}{a}$
 f. $\frac{1}{2}a$
 g. $\frac{a+b}{2}$
 h. -3

2-124

a. $2x$

b. 3

c. 1

d. $\frac{3}{q}$

e. $\frac{3}{5}$

f. $2m$

g. $8pq$

h. $12pq$

2-125

a. $25ab$

b. $9xy$

c. $6pq$

d. $\frac{p}{7}$

e. 10

f. 1

g. $7\frac{1}{2}x$

h. $8b$

2-126

a. $100b$

b. $10x$

c. $2xy$

d. $\frac{2ac}{b}$

e. $4\frac{1}{2}b^2$

f. $5pq$

g. 3

h. $\frac{1}{2ab}$

2-127

a. b

b. $12a$

c. $\frac{1}{2q}$

d. $7\frac{1}{2}ab$

e. $\frac{a}{b}$

f. $\frac{1}{8}$

g. $10ab$

h. $2q$

2-128

a. $\frac{3}{8}(x+y)^2$

b. $-\frac{1}{32}(x-y)^2$

c. $-\frac{3}{25}(a+b)^2$

d. $-\frac{2}{3(a+2b)}$

e. 1

f. 56

g. $-\frac{5b}{6}$

h. $-\frac{5}{2a+2b}$

2-129

a. $\frac{3p(q+2)}{2}$

b. 1

c. 1

d. $4^2 = 16$

e. $\frac{2b}{b+1}$

f. $2^4 = 16$

g. a

h. $-\frac{b^2}{4a}$

2-130

a. -1

b. $\frac{a+1}{a+b}$

c. 9

d. p

e. $-\frac{1}{a+b}$

f. 1

g. a^2

h. $\frac{3}{a+b}$

2-131

- a. $\frac{a}{p^2}$
- b. $-\frac{9}{16}$
- c. $\frac{a+ab+b}{a}$
- d. $\frac{1}{2}$

- e. $\frac{p^8}{a^3}$
- f. $-\frac{a^2+1}{a}$
- g. $\frac{(a+b)^2}{9}$
- h. $-\frac{1}{a}$

2-132

- a. $-\frac{1}{a^2}$
- b. $\frac{a^2-1}{a}$
- c. $\frac{x^2+2xy+y^2}{xy} = \frac{(x+y)^2}{xy}$
- d. $\frac{6}{1-p^2}$

- e. $-a^2$
- f. 1
- g. 1
- h. -2

2-133

- a. $\frac{yz}{x}$
- b. $\frac{a+b}{a-b}$

- c. $\frac{xy}{2z^2}$
- d. -1

- e. $\frac{3x}{4a}$
- f. a

- g. $\frac{x+y}{x}$
- h. $a-b$

2-134

- a. $\frac{a-b}{a}$
- b. $-\frac{x+1}{x}$

- c. $\frac{x-y}{x+y}$
- d. $-\frac{a}{a^2+1}$

- e. $\frac{a-b}{a+b}$
- f. $p^n + 1$

- g. $-\frac{a}{b}$
- h. $\frac{x}{y}$

2-135

- a. $\frac{a-2}{a+2}$
- b. $\frac{x+1}{x+3}$
- c. $\frac{x-3}{x-1}$
- d. $-\frac{1+x}{4x}$

- e. $\frac{x-y}{3}$
- f. $\frac{x-3}{x+2}$
- g. $\frac{x-7}{x-3}$
- h. $\frac{y-z}{y+z}$

2-136

- a. 1
- b. 2
- c. $a-b$
- d. $p+1$

- e. 3
- f. x
- g. 0
- h. $\frac{x+y}{xy}$

2-137

- a. $\frac{xz-y^2}{yz}$
- b. $\frac{x^2-y^2}{xyz}$

- c. $\frac{m^2+n^2}{mn}$
- d. $\frac{a-1}{a^2}$

- e. $\frac{q-p}{p^2q}$
- f. $\frac{a}{c^2}$

- g. $\frac{a+b}{abc}$
- h. $\frac{a-1}{a}$

2-138

- a. $\frac{a^2+1}{a}$
- b. $\frac{2y}{x^2-y^2}$
- c. $\frac{x^2}{x+1}$
- d. $\frac{y}{x-y}$

- e. $\frac{2a^2}{a^2-b^2}$
- f. $\frac{ab}{a+b}$
- g. $-\frac{b}{a+b}$
- h. $\frac{a^2+b^2}{a^2-b^2}$

2-139 a. $\frac{1}{p+2}$
 b. $\frac{2m}{m^2-n^2}$
 c. $\frac{a^2}{(a-b)^2}$
 d. $t + 2$

2-140 a. $\frac{y+1}{y-1}$
 b. $\frac{a-b-c}{a+b-c}$
 c. $\frac{a+b+1}{a+b-1}$
 d. 0

e. $\frac{1}{x^3-x}$
 f. $-\frac{1}{ab}$
 g. $\frac{x}{1-x^2}$
 h. 0

e. $\frac{(a+1)^2}{a^2+1}$
 f. $\frac{x-y+1}{2x}$
 g. 1
 h. a

2-141 $16y^2 - 24xy + 9x^2$

2-142 $144a^2 - 12a + \frac{1}{4}$

2-143 $x^2 + 4x - 77$

2-144 $4a^2 + 52ab + 169b^2$

2-145 $16a^2 - 225$

2-146 $x^4 - 5x^2 - 104$

2-147 $16a^2x^2 - 8axy + y^2$

2-148 $\frac{a^2}{4} - \frac{b^2}{9}$

2-149 $x^2 - 9y^2$

2-150 $144x^3 + 144x^2y + 36xy^2$

2-151 $-x^2 + 9y^2$

2-152 $(x + 3)(x + 4)$

2-153 $(x - 8)(x + 3)$

2-154 $(x + 6)(x - 5)$

2-155 $(3x - y)^2$

2-156 $(x - 2)(x - 10)$

2-157 $(2ab - 3c)^2$

2-158 $(x + 15)(x - 2)$

2-159 $(12y - 7px)(12y + 7px)$

2-160 $9a^2 - 49$

2-161 $x^6 - 1$

2-162 $81x^4 - 625$

2-163 $254\frac{1}{256}$

2-164 $198\frac{1}{196}$

2-165 6396

2-166 $9a^2 - 12ab + 4b^2 - 16c^2$

2-167 $-4(x - 3)(x + 10)$

2-168 $(3y - 10)^2$

2-169 $2(2x + 7)^2$

2-170 $(4c + 9)(4c - 9)$

2-171 $2(c - 12)(c + 12)$

2-172 $3(x^4 - 14)(x^3 + 14)$

2-173 $(y - 3, 5x)(y + 3, 5x)$

2-174 $(15 - b)^2$

2-175 $49y^2 + 70xy + 25x^2$

2-176 $36a^2 - 60a + 25$

2-177 $64a^2 - 100b^2c^2$

2-178 $9c^2 + 66cd + 121d^2$

2-179 $x^2 + 11x - 42$

2-180 $p^2 - 20p + 91$

2-181 $20\frac{1}{4}$

2-182 $\frac{1}{9}a^2 - 4ab + 36b^2$

2-183 $(x + 2)(x + 5)$

2-184 $(x - 9)(x + 2)$

2-185 $(x - 8)(x - 13)$

2-186 $(4x - 3y)^2$

2-187 $(2ab - 5c)^2$

2-188 $(x + -2)(x + 15)$

2-189 $(8y - 9x)(8y + 9x)$

2-190 $(1\frac{2}{3}x - \frac{1}{13}y)(1\frac{2}{3}x + \frac{1}{13}y)$

2-191 $144a^2 - 49$

2-192 $398\frac{1}{400}$

2-193 $16x^4 - 72x^2y^2 + 81y^4$

2-194 $\frac{49}{25}a^2 - 10ab + \frac{225}{49}b^2$

2-195 16891

2-196 $25a^2 - 20ab + 4b^2 - 81c^2$

2-197 $-3(x + 10)(x - 3)$

2-198 $(1\frac{3}{4}x + 1\frac{2}{7})^2$

2-199 $-3(2x + 7y)^2$

2-200 $(3y - 12z)^2$

2-201 $\frac{1}{2}(\frac{1}{2}p - \frac{1}{4})(\frac{1}{2}p + \frac{1}{4})$

Vergelijkingen

3-1 a. 3^e | c. 1^e | e. 2^e

b. 3^e | d. 2^e | f. 2^e

3-2 a. 0 | c. 0 | e. 0 | g. 0

b. 0 | d. 0 | f. 0 | h. 0

3-3 a, b, d, f, en g.

3-4 $a = 0$, $b = 0$ en $c =$ onbekend

3-5 Ans

3-6 hoeft niet, $8 = 1 \cdot 8 = 2 \cdot 4 = 4 \cdot 2 = 8 \cdot 1$

3-7 a. ja, ja b. nee, nee, ja, nee

3-8 a. dan wordt de eerste factor nul. b. $2\frac{1}{2}$

3-9 a. x en $(x - 17)$ b. 0 c. 17 d. 0 en 17

3-10 a. 5, 10 | c. $-3, \frac{1}{2}$ | e. 0, -12

b. 0, 5 | d. 2, -4 | f. $0, 4\frac{1}{2}$

3-11 a. $7 \sqrt{\frac{2}{3}}$ | c. $-5 \sqrt{0}$ | e. $-3 \sqrt{18}$

b. $-8\frac{1}{2} \sqrt{0}$ | d. $-\frac{1}{3} \sqrt{-\frac{7}{5}}$ | f. -3

3-12 $a = 0 \vee b = 0 \vee c = 0$

$1 \vee -3 \vee \frac{1}{7}$

3-13 a. $2 \vee -7 \vee 18$ | c. $0 \vee 1 \vee 1\frac{1}{2}$

b. $-1 \vee -1\frac{1}{2} \vee 14$ | d. $0 \vee -5 \vee 5$

3-14 a. $3 \vee 4$ | c. $-3 \vee -2$ | e. $3 \vee 5$

b. $-10 \vee \frac{1}{3}$ | d. $-5 \vee \frac{2}{3}$ | f. $0 \vee 3$

3-15 a. $-5 \vee 5$ | c. 1 | e. $0 \vee 2$

b. $-3\frac{1}{3} \vee 2\frac{1}{3}$ | d. $-2 \vee 0$ | f. $3\frac{1}{2} \vee 9$

3-16 a. 3 | d. $\frac{2}{5}$

b. ± 2 | e. $12 \vee -\frac{6}{7}$

c. $\frac{6}{7} \vee 3\frac{7}{11}$ | f. $\frac{2}{3} \vee \frac{5}{8}$

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|---|--|--|---|--|---|--|---|--|---|---|---|--|
| <p>3-17</p> <p>a. $3 \vee -5 \vee 4$</p> <p>b. $5 \vee 1$</p> <p>c. $0 \vee 42 \vee 1\frac{1}{2}$</p> | <p>3-18</p> <p>a. $0 \vee 3$</p> <p>b. $0 \vee \frac{2}{3}$</p> | <p>3-19</p> <p>a. $0 \vee \frac{3}{2}$</p> <p>b. $0 \vee \frac{1}{2}$</p> | <p>3-20</p> <p>a. $0 \vee \frac{1}{2}$</p> <p>b. $0 \vee 1\frac{1}{5}$</p> <p>c. $0 \vee 1\frac{2}{17}$</p> | <p>3-21</p> <p>a. $0 \vee -3$</p> <p>b. $-2 \vee 0$</p> | <p>3-22</p> <p>a. $2 \vee \frac{5}{2}$</p> <p>b. $-1 \vee 0$</p> | <p>3-23</p> <p>a. $-3 \vee 1$</p> <p>b. 7</p> | <p>3-24</p> <p>a. $-3 \vee -9$</p> <p>b. ± 3</p> | <p>3-25</p> <p>a. $-6 \vee -4$</p> <p>b. $-1 \vee -3$</p> | <p>3-26</p> <p>a. $-1 \vee -6$</p> <p>b. $-4 \vee -7$</p> <p>c. 6</p> | <p>3-27</p> <p>a. $5 \vee -2$</p> <p>b. $-3 \vee 2$</p> <p>c. $0 \vee -2$</p> | <p>3-28</p> <p>a. $x = 1 \vee x = 2$</p> <p>b. $x = -9 \vee x = 2$</p> | <p>d. $3 \vee -5 \vee 3$</p> <p>e. $-10 \vee 2\frac{1}{2}$</p> <p>f. $\frac{1}{2} \vee 0$</p> <p>e. $0 \vee -5$</p> <p>f. $0 \vee \frac{1}{2}$</p> <p>e. $0 \vee 4$</p> <p>f. $0 \vee \frac{2}{5}$</p> <p>d. $0 \vee -12$</p> <p>e. $0 \vee 1\frac{1}{7}$</p> <p>f. $0 \vee 15\frac{1}{2}$</p> <p>e. $0 \vee 6$</p> <p>f. $-1 \vee 0$</p> <p>e. $-\frac{2}{3} \vee 0$</p> <p>f. $-\frac{1}{2} \vee 0$</p> <p>e. $-1 \vee 49$</p> <p>f. 3</p> <p>e. -9</p> <p>f. $-2 \vee 5$</p> <p>e. $6 \vee 4$</p> <p>f. $-5 \vee 1$</p> <p>d. $-1 \vee -5$</p> <p>e. $6 \vee -1$</p> <p>f. $4 \vee -3$</p> <p>d. $0 \vee -1$</p> <p>e. ± 3</p> <p>f. 9</p> <p>c. $0 \vee 5$</p> <p>d. $0 \vee -2$</p> <p>c. $0 \vee \frac{2}{3}$</p> <p>d. $0 \vee \frac{5}{3}$</p> <p>c. $0 \vee 3$</p> <p>d. $-4 \vee 0$</p> <p>c. $-\frac{1}{3} \vee 0$</p> <p>d. 0</p> <p>c. $1 \vee 3$</p> <p>d. $-3 \vee -2$</p> <p>c. $p = 0 \vee -1$</p> <p>d. $0 \vee 2$</p> <p>c. $-12 \vee 2$</p> <p>d. -2</p> <p>c. $x = -3 \vee x = -1$</p> <p>d. $x = -1 \vee x = 5$</p> <p>e. $x = -3 \vee x = 5$</p> <p>f. $x = 2 \vee x = 4$</p> |
|---|--|--|---|--|---|--|---|--|---|---|---|--|

3-29

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|------------------------|-------------------------|-------------------------|
| a. $x = -7 \vee x = 2$ | c. $x = -5 \vee x = 2$ | e. $x = -8 \vee x = -1$ |
| b. $x = 1 \vee x = 12$ | d. $x = -1 \vee x = 12$ | f. $x = -1 \vee x = 14$ |

3-30

- | | | |
|------------------------|-------------------------|-------------------------|
| a. $x = -1 \vee x = 8$ | c. $x = 1 \vee x = 7$ | e. $x = -6 \vee x = -1$ |
| b. $x = -6 \vee x = 1$ | d. $x = -12 \vee x = 2$ | f. $x = -2 \vee x = 12$ |

3-31

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|--------------------------|-------------------------|-------------------------|
| a. $x = -6 \vee x = -4$ | c. $x = 4 \vee x = 6$ | e. $x = 3 \vee x = 10$ |
| b. $x = -10 \vee x = -3$ | d. $x = -2 \vee x = 15$ | f. $x = -15 \vee x = 2$ |

3-32

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|-------------------------|------------------------|------------------------|
| a. $x = -8 \vee x = -2$ | c. $x = 1 \vee x = 15$ | e. $x = -1 \vee x = 3$ |
| b. $x = -5 \vee x = 6$ | d. $x = -6 \vee x = 5$ | f. $x = -8 \vee x = 3$ |

3-33

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|-------------------------|-------------------------|------------------------|
| a. $x = -9 \vee x = -3$ | c. $x = -7 \vee x = -1$ | e. $x = -3 \vee x = 6$ |
| b. $x = -6 \vee x = 3$ | d. $x = -6 \vee x = 3$ | f. $x = 2 \vee x = 3$ |

3-34

- | | | |
|-------------------------|-------------------------|-------------------------|
| a. $x = 2 \vee x = 3$ | c. $x = -6 \vee x = -1$ | e. $x = -6 \vee x = -1$ |
| b. $x = -4 \vee x = -2$ | d. $x = -4 \vee x = 3$ | f. $x = -7 \vee x = -3$ |

3-35

- | | | |
|------------------------|------------------------|------------------------|
| a. $x = -2 \vee x = 7$ | c. $x = -6 \vee x = 2$ | e. $x = -1 \vee x = 3$ |
| b. $x = -1 \vee x = 5$ | d. $x = -7 \vee x = 1$ | f. $x = -5 \vee x = 7$ |

3-36

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|------------|----------------------|------------|
| a. ± 1 | c. $\pm \frac{3}{4}$ | e. ± 1 |
| b. ± 8 | d. ± 5 | f. ± 9 |

3-37

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|---------------------------|---------------------------|-----------------|
| a. $x = \pm 3\frac{1}{3}$ | c. $x = \pm \frac{7}{11}$ | e. $x = \pm 78$ |
| b. $x = \pm 1\frac{3}{7}$ | d. $x = \pm \frac{2}{5}$ | f. $x = \pm 2$ |

3-38

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|---------------------------|---------------------------|---------------------------|
| a. $x = \pm \frac{4}{15}$ | c. $x = \pm \frac{5}{24}$ | e. $x = \pm \frac{8}{21}$ |
| b. $x = \pm \frac{5}{24}$ | d. $x = \pm \frac{2}{5}$ | f. $x = \pm 1\frac{1}{3}$ |

3-39	a. $0 \vee \pm 4$	c. $0 \vee \pm 3$	e. $2 \vee 9$
	b. $0 \vee 4 \vee 9$	d. $0 \vee \pm 3$	f. $0 \vee -7 \vee 6$
3-40	a. $0 \vee \pm 5$	c. $0 \vee 25$	e. 0
	b. $0 \vee -2 \vee -5$	d. $0 \vee \pm 1$	f. 0
3-41	a. $0 \vee 2 \vee -14$	c. 0	e. ± 2
	b. $0 \vee \pm 3$	d. $-1 \vee 0$	f. ± 1
3-42	a. ± 2	c. 0	e. $2 \vee 3$
	b. 1	d. ± 5	f. k.n.
3-43	a. $0 \vee 25$	c. $0 \vee \pm 5$	e. ± 1
	b. $0 \vee -2 \vee -5$	d. $0 \vee \pm 1$	f. $\pm 2 \vee \pm 3$
3-44	a. ± 10	c. ± 6	e. $\pm 0, 9$
	b. $\pm 0, 4$	d. $\pm \frac{1}{2}$	f. $\pm \frac{3}{2}$
3-45	a. $\pm \frac{1}{2}$	c. $\pm 2\frac{1}{2}$	e. ± 2
	b. geen opl.	d. ± 5	f. ± 4
3-46	a. 0	c. geen opl.	e. ± 3
	b. geen opl.	d. $\pm 0, 8$	f. $\pm \frac{1}{2}$
3-47	a. ± 4	c. k.n.	e. k.n.
	b. ± 2	d. k.n.	f. $\pm \frac{1}{2}$
3-48	a. -6	c. $-9 \vee -3$	e. $-8 \vee 2$
	b. $-5 \vee 13$	d. $-1 \vee 7$	f. $-4 \vee 6$
3-49	a. $-14 \vee 6$	c. $-7 \vee 11$	e. $-8 \vee 2$
	b. $-9 \vee 5$	d. $-9 \vee -3$	f. $-2 \vee 16$
3-50	a. $-\frac{1}{2} \vee \frac{3}{2}$	c. $-\frac{3}{2} \vee -\frac{1}{2}$	e. $\frac{1}{4} \vee \frac{3}{4}$
	b. $-\frac{5}{2} \vee \frac{3}{2}$	d. $-\frac{1}{2} \vee \frac{3}{2}$	f. $-\frac{3}{2} \vee \frac{1}{2}$
3-51	a. $-1\frac{1}{12} \vee 2\frac{5}{12}$	c. $-\frac{10}{21} \vee \frac{8}{21}$	e. $-2\frac{1}{3} \vee 7$
	b. $\frac{9}{16} \vee \frac{19}{16}$	d. $-2\frac{7}{8} \vee \frac{7}{8}$	f. $\frac{6}{55} \vee 2\frac{16}{55}$
3-52	a. $-17 \vee 0$	c. $-\frac{1}{2} \vee \frac{1}{2}$	
	b. $-14 \vee 3$	d. $-7 \vee 5$	
3-53	a. $2 \vee 3$	c. $0 \vee 2$	e. $-7 \vee 7$
	b. -2	d. $2 \vee 4$	f. $0 \vee 4$

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|-------------|--|---------------------------|-------------------------|
| 3-54 | a. $2 \vee 4$ | c. $-9 \vee 10$ | e. $1 \vee 5$ |
| | b. $3 \vee 40$ | d. $3 \vee 4$ | f. -3 |
| 3-55 | a. $-5 \vee 0 \vee 5$ | c. $0 \vee 2 \vee 5$ | e. $-1 \vee 3$ |
| | b. $-\frac{1}{2} \vee 0 \vee \frac{1}{2}$ | d. $2 \vee -5$ | f. $-2 \vee 4$ |
| 3-56 | a. $4 \vee -6$ | | d. $8 \vee \frac{1}{2}$ |
| | b. $-3 \vee 4$ | | e. $3 \vee 10$ |
| | c. $0 \vee 12$ | | f. $3 \vee 7$ |
| 3-57 | a. $-6 \vee 3$ | | c. $-1 \vee 3$ |
| | b. $-\frac{1}{2} \vee 7$ | | d. $-5 \vee 9$ |
| 3-58 | a. $0 \vee 3$ | | c. $0 \vee 12$ |
| | b. $-1 \vee 0 \vee 1$ | | d. $-3 \vee 9$ |
| 3-59 | a. $1 \vee -6$ | | c. $-6 \vee 1$ |
| | b. $-2 \vee 6$ | | d. $-1 \vee 4$ |
| 3-60 | a. $-2 \vee 5$ | | c. $-2 \vee 0 \vee 2$ |
| | b. $-3 \vee 0 \vee 4$ | | d. $-1 \vee 4$ |
| 3-61 | a. 81; 27, b. $x(18 - 3x)$, c. 3, d. 3×9 m | | |
| 3-62 | a. $10x + 2x(x + 8)$, b. 3, (-16 vervalt) | | |
| 3-63 | $\frac{1}{2}$, -4 vervalt. | | |
| 3-64 | 1 en -2 of 6 en 3 | | |
| 3-65 | 4 of $\frac{1}{4}$ | | |
| 3-66 | $\frac{1}{5}$ of $\frac{1}{2}$ | | |
| 3-67 | $\frac{7}{12} \vee \frac{13}{8}$ | | |
| 3-68 | 1 en 7 | | |
| 3-69 | 15 en 20 of -15 en -20 | | |
| 3-70 | a. $10 \vee -10$ | c. $9 \vee -9$ | e. $13 \vee -13$ |
| | b. $1 \vee -1$ | d. $4 \vee -4$ | f. $0,9 \vee -0,9$ |
| 3-71 | a. $0 \vee 1$ | c. $0 \vee -1\frac{1}{2}$ | e. $0 \vee 3$ |
| | b. $0 \vee 1\frac{5}{6}$ | d. $0 \vee 14$ | f. $0 \vee \frac{1}{7}$ |
| 3-72 | a. $0 \vee -1$ | c. $0 \vee 2$ | e. $3 \vee -3$ |
| | b. $4 \vee -4$ | d. $-3 \vee -2$ | f. geen oplossing |
| 3-73 | a. $-3 \vee 1$ | c. $-1 \vee 3$ | e. $-1 \vee 49$ |
| | b. $-49 \vee 1$ | d. 7 | f. $1 \vee 3$ |

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|-------------|----------------------------------|--|-----------------------------------|
| 3-74 | a. $-6 \vee -4$ | c. $-12 \vee 2$ | e. $-2 \vee 12$ |
| | b. $-3 \vee -1$ | d. -2 | f. $-2 \vee 5$ |
| 3-75 | a. $-1\frac{1}{3} \vee 6$ | c. $-2 \vee 1\frac{1}{5}$ | e. $-5 \vee 5$ |
| | b. $-12 \vee 12$ | d. $-22\frac{1}{2} \vee 7\frac{1}{2}$ | f. $-\frac{3}{4} \vee 1$ |
| 3-76 | a. $0 \vee 3$ | c. $0 \vee 2$ | e. $-1 \vee 0$ |
| | b. $0 \vee 14$ | d. $-7 \vee 0$ | f. $0 \vee 2$ |
| 3-77 | a. $-1 \vee 12$ | c. $-12 \vee 1$ | e. $-2 \vee 6$ |
| | b. $-6 \vee 2$ | d. $-3 \vee 4$ | f. $-4 \vee 3$ |
| 3-78 | a. 0 | c. $0 \vee 2$ | e. $0 \vee \frac{2}{3}$ |
| | b. $2 \vee 4$ | d. $-2 \vee 8$ | f. $-10 \vee 4$ |
| 3-79 | a. $-1 \vee 4$ | c. $1 \vee 3$ | e. 4 |
| | b. $2 \vee 4$ | d. $1 \vee 7$ | f. $-3 \vee 10$ |
| 3-80 | a. $-2 \vee 4$ | | c. $1 \vee 3$ |
| | b. $5 \vee 7$ | | d. geen opl. |
| 3-81 | a. $-4 \vee 1$ | | c. $9 \vee -3$ |
| | b. $3 \vee 10$ | | d. $-5 \vee 3$ |
| 3-82 | a. $3 \vee 4$ | | c. $-4 \vee 5$ |
| | b. $0 \vee 1\frac{1}{3}$ | | d. $-8 \vee 5$ |
| 3-83 | a. $0 \vee 2$ | | c. $-8 \vee 2$ |
| | b. 5 | | d. $5 \vee 7$ |
| 3-84 | a. $5 \vee 7$ | | c. $-1\frac{1}{5} \vee 10$ |
| | b. $-8 \vee -2$ | | d. $-1 \vee 1$ |
| 3-85 | a. $1 \vee 4$ | | c. $-4 \vee -2$ |
| | b. $2 \vee 5$ | | d. $-11 \vee 1$ |
| 3-86 | a. $-5 \vee 7$ | | c. $-2 \vee 9$ |
| | b. $-10 \vee 1$ | | d. ± 4 |
| 3-87 | a. -3 | | c. $-3 \vee -2$ |
| | b. $-4 \vee -1$ | | d. $-10 \vee 3$ |
| 3-88 | a. $3 \vee 13$ | | c. $-4 \vee -11$ |
| | b. $-9 \vee -4$ | | d. $-1 \vee 6$ |

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|--------------|-----------------------------------|----------------------------------|
| 3-89 | a. $1 \vee 8$ | c. $-12 \vee 2$ |
| | b. 1 | d. $-11 \vee 4$ |
| 3-90 | a. $-5 \vee 14$ | c. $-5 \vee 0$ |
| | b. $-9 \vee -2$ | d. $1 \vee 7$ |
| 3-91 | a. $-7 \vee -1$ | c. $-4 \vee 10$ |
| | b. $-12 \vee 1$ | d. $3 \vee 8$ |
| 3-92 | a. $2 \vee 5$ | c. $-3 \vee 2$ |
| | b. $-4 \vee 12$ | d. $-1 \vee 4$ |
| 3-93 | a. $2 \vee 4$ | c. $-11 \vee -3$ |
| | b. $3 \vee 4$ | d. $-5 \vee 0$ |
| 3-94 | a. $-1 \vee 8$ | c. $-8 \vee 4$ |
| | b. $-10 \vee -4$ | d. $-2 \vee 0$ |
| 3-95 | a. $-7 \vee 1$ | c. $0 \vee 1$ |
| | b. $-4 \vee 2$ | d. $-5 \vee -2$ |
| 3-96 | a. $1 \vee 4$ | c. $2 \vee 5$ |
| | b. $2 \vee 10$ | d. $-11 \vee 1$ |
| 3-97 | a. $-11 \vee 5$ | c. 1 |
| | b. $-5 \vee \frac{3}{5}$ | d. $-\frac{4}{5} \vee 5$ |
| 3-98 | a. $\frac{4}{5} \vee 3$ | c. $-1 \vee \frac{2}{3}$ |
| | b. $-4 \vee -1\frac{1}{3}$ | d. $-4 \vee 1\frac{1}{3}$ |
| 3-99 | a. $-\frac{3}{4} \vee 2$ | c. $-\frac{1}{5} \vee 1$ |
| | b. $-\frac{2}{3} \vee 2$ | d. 1 |
| 3-100 | a. $-\frac{3}{5} \vee 0$ | c. $-\frac{1}{3} \vee 5$ |
| | b. $\frac{4}{5} \vee 0$ | d. $\frac{3}{4} \vee 2$ |
| 3-101 | a. $-\frac{3}{4} \vee 1$ | c. $-3 \vee \frac{2}{3}$ |
| | b. $-1 \vee \frac{1}{5}$ | d. $-2 \vee -\frac{2}{5}$ |
| 3-102 | -2 | |
| 3-103 | $-3\frac{2}{3}$ | |
| 3-104 | $-4 \vee 5$ | |
| 3-105 | $3 \vee 10$ | |
| 3-106 | $-\frac{4}{5}$ | |
| 3-107 | $-\frac{1}{5} \vee 9$ | |

3-108	$-\frac{17}{8} \vee 0$
3-109	$-5 \vee 2$
3-110	$0 \vee 4\frac{1}{3}$
3-111	$-7 \vee -2$
3-112	$-2 \vee 5$
3-113	$-2\frac{1}{2}$
3-114	$-5 \vee 14$
3-115	$\pm\frac{3}{4}$
3-116	$-5 \vee 8$
3-117	$-12 \vee 18$
3-118	$-3\frac{1}{7} \vee 2\frac{4}{7}$
3-119	$-3\frac{11}{28} \vee 3\frac{3}{4}$

Meetkunde

4-1	75°
4-2	85°
4-3	55°
4-4	$65^\circ, 60^\circ$ en 55°
4-5	$70^\circ, 65^\circ$
4-14	$a = 8; b = 17; c = 5; d = 3$
4-15	$a = 5; b = 10; c = 12; d = 15$
4-16	$a = 16; b = 12; c = 6; d = 12$
4-17	$a = 15; b = 20; c = 8; d = 9$

$$\left. \begin{array}{l} \text{4-18} \\ \text{CF} = \text{FG} \\ \angle\text{AFC} = \angle\text{BFG} \\ \text{AF} = \text{BF} \end{array} \right\} \xrightarrow{\text{ZHZ}} \triangle\text{BFG} \cong \triangle\text{AFC} \text{ dus: } \text{BG} = \text{AC} \quad \text{q.e.d.}$$

4-20] Teken $\triangle\text{ABC}$ met F op het midden van AB. Dan is CF de zwaartelijn uit C. Trek nu de lijnstukken $\text{AD} \perp \text{CF}$ en $\text{BE} \perp \text{CF}$. Nu is te bewijzen dat $\text{AD} = \text{BE}$

Bewijs:

$$\left. \begin{array}{l} \text{AF} = \text{BF} \text{ (zwaartelijn)} \\ \angle\text{AFD} = \angle\text{BFE} \text{ (overst. hoek)} \\ \angle\text{D} = \angle\text{E} = 90^\circ \text{ (afstand)} \end{array} \right\} \xrightarrow{\text{ZHH}} \triangle\text{AFD} \cong \triangle\text{BFE} \text{ dus: } \text{AD} = \text{BE} \quad \text{q.e.d.}$$

4-46	$55^\circ, 25^\circ$
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Herhaling algebra

- | | | |
|-------------|--------------------|---------------------|
| 5-1 | a. 11 | c. -2 |
| | b. 4 | d. -2 |
| 5-2 | a. $4\frac{1}{2}$ | c. $9\frac{1}{9}$ |
| | b. 6 | d. 9 |
| 5-3 | a. -2 | c. $3\frac{1}{2}$ |
| | b. 2 | d. 4 |
| 5-4 | a. $4\frac{1}{2}$ | c. 1 |
| | b. $2\frac{1}{4}$ | d. -3 |
| 5-5 | a. -2 | c. $2\frac{1}{2}$ |
| | b. -4 | d. 4 |
| 5-6 | a. 4 | c. $-1\frac{3}{5}$ |
| | b. 6 | d. 6 |
| 5-7 | a. -16 | c. $2\frac{13}{16}$ |
| | b. $17\frac{3}{5}$ | d. $14\frac{2}{5}$ |
| 5-8 | a. -2 | c. 15 |
| | b. -25 | d. -4 |
| 5-9 | a. $-6\frac{2}{3}$ | c. 1 |
| | b. -4 | d. -2 |
| 5-10 | a. $-\frac{5}{4}$ | c. 1 |
| | b. -4 | d. -2 |
| 5-11 | a. 5 | b. -9 |
| 5-12 | $5\frac{1}{2}$ | |
| 5-13 | 6 | |
| 5-14 | 4 | |
| 5-15 | 8 | |
| 5-16 | -2 | |
| 5-17 | a. 4 | c. -9 |
| | b. -3 | d. $3\frac{1}{2}$ |
| 5-18 | a. -11 | c. 7 |
| | b. 3 | d. -2 |

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|------|---------------------------------------|---|----------------------------------|
| 5-19 | a. 5 | | c. -2 |
| | b. -3 | | d. $\frac{1}{2}$ |
| 5-20 | a. -2 | | c. 12 |
| | b. $-4 \vee 1$ | | d. $-6 \vee 1$ |
| 5-21 | a. $-4 \vee 5$ | | c. 5 |
| | b. $\frac{5}{3} \vee 3$ | | d. $-8 \vee 5$ |
| 5-22 | 10 | | |
| 5-23 | -45 | | |
| 5-24 | 0 | | |
| 5-25 | 7, 8 en 9 | | |
| 5-26 | 18, 19, 20, 21, 22 | | |
| 5-27 | a. $p^2 + 2pq + q^2$ | c. $4p^2 + 4pq + q^2$ | e. $9p^2 + 24pq + 16q^2$ |
| | b. $\frac{1}{4}a^2 + 2ab + 4b^2$ | d. $\frac{4}{9}a^2 + 2ab + \frac{9}{4}b^2$ | f. $x^4 + 2x^2y^2 + y^4$ |
| 5-28 | a. $162\frac{9}{16}$ | c. $31\frac{9}{25}$ | e. $87\frac{1}{9}$ |
| | b. $18\frac{1}{16}$ | d. $42\frac{1}{4}$ | f. $68\frac{1}{16}$ |
| 5-29 | a. $p^2 - 2pq + q^2$ | c. $16p^2 - 40pq + 25q^2$ | e. $9p^2 - 3pq + \frac{1}{4}q^2$ |
| | b. $\frac{16}{25}a^2 - 8ab + 25b^2$ | d. $\frac{1}{16}a^2 - \frac{1}{4}ab + \frac{1}{4}b^2$ | f. $4x^2 - 12xy + 9y^2$ |
| 5-30 | a. $94\frac{9}{10}$ | c. $40\frac{1}{36}$ | e. $386\frac{7}{9}$ |
| | b. $62\frac{1}{64}$ | d. $14\frac{1}{16}$ | f. $23\frac{1}{5}$ |
| 5-31 | a. $p^2 - q^2$ | c. $4p^2 - q^2$ | e. $\frac{1}{4}a^2 - b^2$ |
| | b. $\frac{4}{9}a^2 - \frac{9}{16}b^2$ | d. $0,01a^2 - b^2$ | f. $x^4 - y^6$ |
| 5-32 | a. $80\frac{15}{16}$ | c. 999.991 | e. $99\frac{8}{9}$ |
| | b. 9999 | d. 9996 | f. $35\frac{3}{4}$ |
| 5-33 | a. $40\frac{1}{9}$ | | c. $47\frac{1}{49}$ |
| | b. $48\frac{40}{49}$ | | d. $3\frac{8}{9}$ |
| 5-34 | a. $9a^2 - 2ab + \frac{1}{9}b^2$ | | c. $4x^2 - 12xy + 9y^2$ |
| | b. $16x^2 - \frac{1}{4}y$ | | d. $16a^2 - 32ab + 16b^2$ |
| 5-35 | a. 9975 | | c. $\frac{20\,449}{144}$ |
| | b. $\frac{28\,224}{169}$ | | d. 3 999 999 |
| 5-36 | a. $(p + q)^2$ | | c. $(a - 3b)^2$ |
| | b. $(4a + 5b)^2$ | | d. $(4a - 5b)(4a + 5b)$ |

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|---|--|---|
| <p>5-37 a. $(2p - 6q)^2$
 b. $(2a + \frac{1}{2}b)(2a - \frac{1}{2}b)$</p> <p>5-38 a. $(\frac{2}{3}a + \frac{3}{2}b)^2$
 b. $(10x + 10y)^2$</p> <p>5-39 a. $(12a - 10b)(12a + 10b)$
 b. $(2\frac{1}{2}x - 3\frac{1}{2}y)^2$</p> <p>5-40 a. $\frac{x+2}{2}$
 b. $\frac{x+5}{x+6}$
 c. 1</p> <p>5-41 a. $\frac{a-7}{2a-3}$
 b. $\frac{1}{4}$
 c. $\frac{2p+3}{3p+5}$</p> <p>5-42 a. -57
 b. -1296</p> <p>5-43 a. $\frac{16}{49}$
 b. $\frac{2176}{441}$</p> <p>5-44 a. -2
 b. $\frac{4}{3}$</p> <p>5-45 a. $0 \vee \frac{5}{7}$
 b. $-\frac{2}{5} \vee 0$
 c. $0 \vee -\frac{2}{5}$</p> <p>5-46 a. $3 \vee 5$
 b. $\pm\frac{1}{2} \vee 2$
 c. $0 \vee 2$</p> | <p>c. 56
 d. $\frac{256}{25}$
 c. $\frac{2209}{196}$
 d. $\frac{261}{16}$
 c. 25
 d. $\frac{2}{5}$</p> | <p>c. $(3a - 2b)^2$
 d. $(\frac{1}{2}a - \frac{1}{2}b)^2$
 c. $(\frac{1}{4}a - 0,4b)(\frac{1}{4}a + 0,4b)$
 d. $(12a - 10b)^2$
 c. $(1\frac{1}{2}x - 2\frac{1}{2}y)(1\frac{1}{2}x + 2\frac{1}{2}y)$
 d. $(ab + bc)^2$
 d. $\frac{x-5}{2}$
 e. $\frac{p-q}{p+q}$
 f. $\frac{x-1}{x-3}$
 d. $\frac{5(a-b)}{3ab}$
 e. $\frac{a}{6b}$
 f. $\frac{3}{p-3}$
 e. -65
 f. $\frac{4}{25}$
 e. 100
 f. 0
 e. 150
 f. $\frac{13}{4}$
 d. $-\frac{3}{8} \vee 0$
 e. $0 \vee 6$
 f. $0 \vee \frac{9}{7}$
 d. $2\frac{1}{2} \vee \frac{3}{4}$
 e. $-\frac{5}{8} \vee \frac{28}{11}$
 f. $-\frac{1}{6} \vee 4$</p> |
|---|--|---|

5-47 a. $-3 \vee 2$

b. $4 \vee 5$

c. $-4 \vee \frac{1}{2}$

5-48 a. $-7 \vee 0$

b. $5 \vee 34$

c. $-\frac{3}{4} \vee 0$

5-49 a. $\pm \frac{2}{5}$

b. $-\frac{4}{5} \vee 2\frac{2}{5}$

c. $\pm \frac{10}{3}$

5-50 a. $\pm \frac{13}{6}$

b. ± 27

c. ± 2

5-51 a. $5 \vee 14$

b. $-\frac{1}{5} \vee 4$

5-52 a. $0 \vee \frac{13}{3}$

b. ± 11

5-53 a. $\pm \frac{13}{3}$

b. $-\frac{8}{3} \vee 1$

5-54 a. $-\frac{3}{4} \vee \frac{15}{4}$

b. $\pm \frac{6}{7}$

d. $-6 \vee 1$

e. $\pm 2\sqrt{5}$

f. $\frac{7}{3} \vee 5$

d. $-3 \vee 3$

e. $-\frac{2}{5} \vee \frac{2}{5}$

f. $0 \vee \frac{1}{8}$

d. $-4\frac{4}{7} \vee 4$

e. $-3 \vee 9$

f. $\pm \frac{7}{11}$

d. $\pm \frac{10}{7}$

e. $\pm \frac{2}{5}$

f. $\pm \frac{4}{15}$

c. $-\frac{17}{8} \vee 0$

d. $-4 \vee 5$

c. $-7 \vee -2$

d. ± 10

c. $\pm \frac{16}{3}$

d. $-\frac{1}{2} \vee 4$

c. $-5 \vee 4$

d. $\pm \frac{1}{102}$

e. $-5 \vee 2$

f. $3 \vee 10$

e. $-2 \vee 5$

f. ± 7

e. $-5 \vee 7$

f. $\pm \frac{3}{4}$

e. $-6\frac{1}{2} \vee 2\frac{1}{2}$

f. $0 \vee \pm \frac{13}{2}$

Kangoeroe opgaven

8-1 C

8-2 B

8-3 C

8-4 B

8-5 C

8-6 A

8-7 C

8-8 E

8-9 E

8-10 B

8-11 C

8-12 E

8-13 C

8-14 C

8-15 D

8-16 D

8-17 D

8-18 D

8-19 C

8-20 E

8-21 C

8-22 D

8-23 C

8-24 D

8-25 D

8-26 C

8-27 C

8-28 C

8-29 B

8-30 B

8-31 C

8-32 A

8-33 E

8-34 E

8-35 A

8-36 C