Sheet 2

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Aufgabe 1

a) i) 121 - 73

```
121 : 2 = 60  R 1
 60 : 2 = 30  R 0
 30 : 2 = 15  R 0
 15 : 2 =  7  R 1
  7 : 2 =  3  R 1
  3 : 2 =  1  R 1
  1 : 2 =  0  R 1
```

```
73 : 2 = 36  R 1
36 : 2 = 18  R 0
18 : 2 =  9  R 0
 9 : 2 =  4  R 1
 4 : 2 =  2  R 0
 2 : 2 =  1  R 0
 1 : 2 =  0  R 1
```

Zweierkomplement:

```
  10110110
+         1
----------
  10110111
```

```
  01111001
+ 10110111
  11111111
----------
  00110000
```

32 + 16 = 48

ii) 42 - 59

```
42 : 2 = 21 R 0
21 : 2 = 10 R 1
10 : 2 =  5 R 0
 5 : 2 =  2 R 1
 2 : 2 =  1 R 0
 1 : 2 =  0 R 1
```

```
59 : 2 = 29 R 1
28 : 2 = 14 R 1
14 : 2 =  7 R 0
 7 : 2 =  3 R 1
 3 : 2 =  1 R 1
 1 : 2 =  0 R 1
```

Zweierkomp.:

```
  11000100
+         1
----------
  11000101
```

```
  00101010
+ 11000101
----------
  11101111
```

iii) -100 +81

```
100 : 2 = 50  R 0
 50 : 2 = 25  R 0
 25 : 2 = 12  R 1
 12 : 2 =  6  R 0
  6 : 2 =  3  R 0
  3 : 2 =  1  R 1
  1 : 2 =  0  R 1
```

Zweierkomp.:

```
  10011011
+         1
----------
  10011100
```

```
 81 : 2 = 40  R 1
 40 : 2 = 20  R 0
 20 : 2 = 10  R 0
 10 : 2 =  5  R 0
  5 : 2 =  2  R 1
  2 : 2 =  1  R 0
  1 : 2 =  0  R 1
```

```
  10011100
+ 01010001
----------
  11101101
```

b)

```
byte b = 1;      short s = 3;
int i = 5;       long l = 34;
float f = 5;     double d = 18.8;
```

i) `b = i;` ✗

ii) `i = b;` ✓

iii) `s = (int) s + i;` ✗

iv) `l = i + b · s` ✓

v) `l = (i > s);` ✗

vi) `i = i · f` ✗

vii) `f = f + i + 13.4` ✓

viii) `d = f · l` ✓

i) `b = (byte) i;`

iii) `s = (short)(s+i);`

v) `boolean l2 = (i > s);`

vi) `i = i · (int)f;`