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Exercise 6.6

part b:

```
> sort({seq(seq(3*x+5*y, x=0..6), y=0..6)});  
{0, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34,  
 35, 36, 37, 38, 39, 40, 42, 43, 45, 48}
```

>
We see from this list that the numbers missing are 1, 2, 4, 7.

part c

(i):

```
> sort({seq(seq(3*x+7*y, x=0..6), y=0..6)});  
{0, 3, 6, 7, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36,  
 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 53, 54, 57, 60}
```

>
The largest number missing is 11.

(ii):

```
> sort({seq(seq(5*x+7*y, x=0..6), y=0..6)});  
{0, 5, 7, 10, 12, 14, 15, 17, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41,  
 42, 43, 44, 45, 46, 47, 48, 50, 51, 52, 53, 55, 57, 58, 60, 62, 65, 67, 72}
```

>
The largest number missing is 18.

(iii):

```
> sort({seq(seq(4*x+11*y, x=0..10), y=0..10)});  
{0, 4, 8, 11, 12, 15, 16, 19, 20, 22, 23, 24, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44,  
 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72,  
 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99,  
 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120,  
 122, 123, 124, 126, 127, 128, 130, 131, 134, 135, 138, 139, 142, 146, 150}
```

The largest number missing is 29.

part d:

checking the conjecture with two more values

```
> sort({seq(seq(8*x+5*y, x=0..10), y=0..10)});  
{0, 5, 8, 10, 13, 15, 16, 18, 20, 21, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43,  
44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71,  
72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99,  
100, 101, 102, 104, 105, 106, 107, 109, 110, 112, 114, 115, 117, 120, 122, 125, 130}
```

The largest number missing is 27.

```
> sort({seq(seq(10*x+9*y, x=0..10), y=0..10)});  
{0, 9, 10, 18, 19, 20, 27, 28, 29, 30, 36, 37, 38, 39, 40, 45, 46, 47, 48, 49, 50, 54, 55, 56, 57, 58, 59, 60, 63, 64,  
65, 66, 67, 68, 69, 70, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93,  
94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115,  
116, 117, 118, 120, 121, 122, 123, 124, 125, 126, 127, 130, 131, 132, 133, 134, 135, 136, 140, 141, 142,  
143, 144, 145, 150, 151, 152, 153, 154, 160, 161, 162, 163, 170, 171, 172, 180, 181, 190}
```

The largest number missing is 71.

part f:

```
> sort({seq(seq(seq(6*x+10*y+15*z, x=0..6), y=0..6), z=0..6)});  
{0, 6, 10, 12, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44,  
45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72,  
73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99,  
100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120,  
121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141,  
142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 158, 159, 160, 161, 162, 164,  
165, 166, 168, 170, 171, 174, 176, 180, 186}
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>

The largest number missing here is 29.

>

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