Exercise Set 2

20) $a = 5280, \quad b = 3600$

$ax + by = r$

	x_i	y_i	r_i	q_i
1)	1	0	5280	
2)	0	1	3600	
3)	1	-1	1680	1
	-2	3	240	2
			0	7

gcd

$\gcd(a, b) = 240$

$5280 \cdot (-2) + 3600 \cdot 3 = 240$

$x \qquad y$

32) $14x + 18y = 5$

does not have a solution, since $\gcd(14, 18) = 2$ does not divide 5.

38) $212x + 37y = 1$

	x_i	y_i	r_i	q_i
1)	1	0	212	
2)	0	1	37	5
3)	1	-5	27	5
4)	-1	6	10	1
5)	3	-17	7	2
6)	-4	23	3	1
7)	11	-63	1	2
			0	

gcd

Particular solution: $221 \cdot 11 + 37 \cdot (-63) = 1$.

38 (cont.): General soln of $221x + 37y = 1$ $\quad (x, y)$

$$221\underbrace{(11 + 37n)}_{x} + 37\underbrace{(-63 - 212n)}_{y} = 1$$

48) $17x + 11y = 1 \quad (8)$

1	0	17	
0	1	11	
1	-1	6	1
-1	2	5	1
2	-3	1	1
-11	17	0	5

$$17(2 - 11n) + 11(-3 + 17n) = 1$$

Question asks for $x, y \in \mathbb{Z}^+$

$\therefore \quad 2 - 11n > 0 \Rightarrow n < \frac{2}{11} \rightarrow n \leq 0$

$17n - 3 > 0 \Rightarrow n > \frac{3}{17} \Rightarrow n \geq 1$

contradiction

$\therefore$ no positive solutions exist

$\therefore$ $17x + 11y = 120$ has no positive integer solutions