

Remember, there are two kinds of homework problems: ungraded and graded. Ungraded problems have answers in the back of the book. Subject to unimportant numerical changes, one or two of them will show up on each test. Graded problems don't have answers in the back of the book. Some of them will come with a symbol such as (\mathcal{E}) , meaning that it is an old exam question.

1. – §3.4 – 5 a,b (ungraded).
2. – §3.6 – 1 a,b (ungraded).
3. – §4.1 – 1 (ungraded).
4. – §3.4 – 32 a,c
5. – §3.4 – 36.
6. – §3.4 – 62 a,d (use $a \mid b \implies x^a - y^a \mid x^b - y^b$).
7. – §3.6 – 2 a,b.
8. – §3.6 – 22 (A harder problem; in my solution, the integer “196” plays a prominent role. It is not assumed that x, y are both positive!)
9. – (\mathcal{E}) Find all solutions to the equation
$$20x + 15y = 200 \dots$$
 - a. . . . in integers (x, y) .
 - b. . . . in **positive** integers (x, y) .
10. – (\mathcal{E}) Find all positive integers n with the property that $n/2$ is a square and $n/3$ is a cube. Hint: write $n = 2^a 3^b m$, where $\gcd(m, 6) = 1$.