During the last few years approximately 20% to 25% of my Math 1120 students have been unsuccessful in the course on account of their difficulty with algebra. Many find themselves able to understand the ideas of calculus, but unable to communicate their understanding because they mess up the algebra. The problems below represent topics with which a student beginning Math 1120 Business Calculus should be familiar. The problems should be completed in an hour **without** any aids, including a calculator. A score of 10 or more out of 15 means you're probably ready for this course.

1. Compute the value of $\frac{1}{2} - \frac{1}{3} + \frac{1}{7}$, and express your answer as a simple fraction.

2. Find the y-intercept of the line that passes through the point $(2, 3)$ and has a slope of 6.

3. One solution to $(x - 1)(x + 4) + (x - 1)(x + 7) = 0$ is $x = 1$. Find another solution.

4. A rectangle is partitioned into 4 smaller rectangles. Three of the areas are shown. What is the area of the fourth one?

40	30
200	x

5. A rectangle with sides of length $x^2 + xy + y^2$ and $x - y$ is partitioned into 6 smaller rectangles. Find the area of the large rectangle in simplest terms.
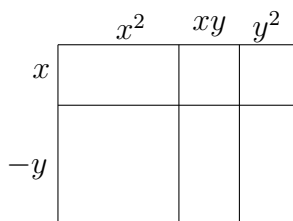
6. Rewrite the number $6^9 \cdot 9^6 \cdot 12^3 \cdot 3^{12}$ in the form $u^v \cdot w^z$.

7. Put the numbers $2^{150}, 3^{100}, 5^{75}, 7^{50}$ in order from smallest to largest.

8. A store reduces the price of an item by 20% and then gives a coupon for another 30% discount. What is the overall discount?

9. A family goes on a vacation in their car. They average 60 miles per hour getting to their destination, and 40 miles per hour getting home. What is their overall average speed?

10. Find a fraction (with whole number parts) between $1/3$ and $2/5$. Explain why your answer is correct.

11. Let $f(x) = 2x + 3$ and $g(x) = 2/(x+1)$. Build the composite function $f \circ g(x)$.

12. What is the (implied) domain of the function $f(x) = \frac{3x+5}{x^2-4}$? Write your answer in interval notation.

13. Express $\frac{x^2+2x-3}{x^2-3x+2}$ in simplest form and draw its graph.

14. What is the value of $\log_{12} 3^5 \cdot 2^{10}$?

15. Find all values of x for which $|x - 1| + |x - 2| + |x + 7| = 18$.