Mathematics Placement Test
Practice Problems
Section II

The following questions are a sample of the types of problems you might see on the Mathematics Placement Test. **Calculators are not permitted for the test.**

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1. Determine the value of c for which $x^2 - cx + 9$ is a perfect square.
   ANSWER $c = 6$

2. Express $\log(x) - \log(y)$ as a single $\log$.   **ANSWER** $\log\left(\dfrac{x}{y}\right)$

3. Express the equation $10^c = 4$ using logarithms.   **ANSWER** $c = \log(4)$

4. If $f(x) = x^3 - 2x$, then $f(x - 12)$ is equal to what?
   ANSWER $x^3 - 36x^2 + 430x - 1704$

5. Perform the addition $\dfrac{3}{2x - 1} + \dfrac{5}{x + 1}$.   **ANSWER** $\dfrac{13x - 2}{(2x - 1)(x + 1)}$

6. If $f(x) = x^2 + 1$, what is the slope of the line that passes through $(1, f(1))$ and $(3, f(3))$?   **ANSWER** 4

7. An angle has a radian measure of $\dfrac{3\pi}{2}$. What is the angle in degrees?
   ANSWER 270 degrees

8. The hypotenuse of a right triangle has length 7 and one of its legs has length 2. Determine the length of the remaining leg.   **ANSWER** $\sqrt{45}$

9. If $f(x) = 2x + 1$ and $g(x) = x^2$, then determine an expression for $g(f(x))$.
   ANSWER $(2x + 1)^2$

10. Determine all values of $\cos^{-1}\left(\dfrac{-1}{2}\right)$.   **ANSWER** $\dfrac{2}{3}\pi$ or 120 degrees