

AMS 151.1 Applied Calculus I

Instructor: Ryan Kaufman

Prerequisite Test

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IN ORDER TO RECEIVE FULL CREDIT, PLEASE SHOW ALL WORK AND EXPLAIN YOUR REASONING.

NO CREDIT WILL BE GIVEN FOR A NUMERICAL ANSWER WITHOUT SOME WRITTEN EXPLANATION!!

1. Calculate the area of a triangle with sides of length 6, 8, and 10.
2. $P(t)$ is an exponential function, and $P(5) = 10$, and $P(6) = 100$. Find an expression for $P(t)$.
3. Solve this equation for t : $y = \frac{A*(1-t)}{1+t} + B$
4. The inequality $3|3 - x| < \frac{3}{2}$ describes an interval on the line. Find that interval.
5. Find the equation of the line through the point $(2, 3)$ and with slope $-\frac{3}{2}$.
6. Find all real numbers x satisfying $3x^2 + 6x > 30$
7. What is the area of the triangle bounded by the lines $y = 2x + 2$, $y = -2x + 10$, and the x axis.
8. Let $f(x) = \frac{(x+1)^2}{x+2}$ and let $g(x) = -x$. Determine $f(g(0))$ and $g(f(0))$.
9. Find the equation of the line through the points $(5, 3)$ and $(0, 0)$.
10. Let $f(x) = x^2 + 2x + 1$ and let $g(x) = \sqrt{x} + 1$. Determine $f(g(x))$ and $g(f(x))$.
11. Find all numbers x satisfying $1/(x + 1) + 1/x^2 = 2$.
12. Find x satisfying $22x = 8(x + 1)$.
13. Find x satisfying $\log_{10}(x^2 - 1) - \log_{10}(x^2 + 3x + 2) = 1$.
14. A drug is absorbed at a rate of 15% / hour. A patient is injected with 25mg when he is admitted to the hospital at 5:00am. The next morning at 5am, the ignorant nurse thought the chart said 5pm, and didn't check his blood level as he was supposed to. When the doctor found out and checked it herself, it was already noon. What is the blood level that she recorded?
15. If triangle ABC is a right triangle, and the length of leg $a = 5$, the length of leg $b = 12$, and c is the hypotenuse:
 - a) What is the length of the hypotenuse?
 - b) What is $\sin(A)$?
 - c) What is $\cot(A)$?