



# Paul the Tutor's Sample Problems

These problems give you an example of the level of difficulty of problems you need to be able to tutor in order to work for Paul the Tutor's Education Centers. For all of these questions you will have full access to text books as well as the internet. You can also ask your student for a few minutes to review material before explaining it to them.

## Calculus

1. If  $y = \sin(x^2 + 1)x$  what is the value of  $dy/dx$ ? What is  $\int_0^5 y(dx)$
2. Given a graph of  $y'$  be able to approximate the graphs of  $y$  or  $y''$
3. If  $y = x^2 + xy + 4y^3$  what is the value of  $dy/dx$ ?

## Chemistry

1. Use solubility tables and various molarity values to predict precipitate formations
2. Find limiting reagent, and predict outcomes of reactions given formulas and quantities of reactants.
3. Draw the lewis dot structure for  $\text{CH}_3\text{OH}$

## Physics

1. Given a diagram of a ramp, predict the velocity of a block sliding down it
2. Determine the resistance, voltage, current, etc... given a circuit diagram.

## Biology

1. Explain how water is transported from roots to leaves
2. Explain how weather patterns create various biomes.
3. Be able to create a punnett square given parents genotypes. Results should include frequency of various phenotypes based on dominance, and expected results if genes are linked.

## English

1. Outline an essay on the foreshadowing/characters symbolism/view from particular belief system of novel xxxxxx
2. Proof-read and help improve a student's essay

## History

1. Compare the rebuilding of the US South after the civil war to that of Germany after WWI
2. In what ways was the industrial revolution a cultural revolution?