

Questions and Solutions

Your Name

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1 Mathematical Problems

1 Velocity

Question 1.1.1 A train leaves New York at 8:00 AM traveling west at 60 mph. Another train leaves Los Angeles at 6:00 AM traveling east at 70 mph on the same track. If the distance between New York and Los Angeles is 2,800 miles, at what time will the two trains meet?

Hint: Use the relative speed concept to determine the time when the two trains meet.

Question 1.1.2 Solve for x in the equation $x^2 - 4 = 0$.

Hint: Factor the equation or use the quadratic formula.

2 Topic

1 Subtopic

Question 2.1.1 What is the derivative of $f(x) = x^3$?

Hint: Use the power rule for differentiation.

Question 2.1.2 Evaluate the integral $\int x \, dx$.

Hint: Use the power rule for integration.

Solutions

Solution 2.1.1 The two trains will meet at 4:28 AM the next day.

Solution 2.1.2 The solutions are $x = 2$ and $x = -2$.

Solution 2.1.3 The derivative is $f'(x) = 3x^2$.

Solution 2.1.4 The integral evaluates to $\frac{x^2}{2} + C$.