

Practice for Applications of Algebra and Calculus Assessment
Applications of Algebra and Calculus Assessment Standard 1.5

1. A particle is travelling in a straight line according to the equation $x(t) = 2t^2 + t + 1$.
Find the velocity and acceleration after 5 seconds. (3)
2. A bus starts at rest at a bus stop. It then travels along a straight road. Its velocity, $v(t)$ metres per second, is given by
$$v(t) = \frac{80t}{4t + 3}$$

Find the acceleration of the bus at 5 seconds (4)
3. A particle moves according to the equation $x(t) = \frac{t}{\cos \pi t}$ metres where t is the time in seconds since the particle started moving.
Find the velocity of the particle after 3 seconds. (3)
4. The area bounded by the curve $y = \sqrt{5x - 2}$ between 1 and 4 is rotated 2π radians about the x -axis.

Determine the exact value of the volume of the solid formed. (4)
5. The section of the curve $y = x^3$ between $y = 0$ and $y = 8$ is rotated about the y -axis calculate the volume of revolution. (3)