Name: _____

A-Level Maths

Variable Acceleration

Instructions

- Use black ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided there may - be more space than you need.
- Diagrams are **NOT** accurately drawn, unless otherwise - indicated.
- You must show all your working out.

Information

- The marks for each question are shown in brackets use - this as a guide as to how much time to spend on each question.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

My Exam Revision

1. A particle moves along a straight line with velocity given by $v = 3t^2 - 4t + 2$ m/s. Find the acceleration at $t = 3$ seconds.

(Total 5 marks)

2. The displacement of a particle is given by $s = 2t^3 - 5t^2 + 4t$, where s is in meters and t is in seconds.

Find the velocity and acceleration at $t = 2$ seconds.

(Total 5 marks)

My Exam Revision

3. A particle moves such that its acceleration is given by $a = 6t - 4$.

If its initial velocity is 3 m/s when $t = 0$, find the velocity function $v(t)$.

(Total 5 marks)

4. A particle moves with acceleration $a = 12t^2 - 6t$.

Given that its velocity is 5 m/s when $t = 1$, find the velocity when $t = 3$.

(Total 5 marks)

My Exam Revision

5. The velocity of a particle moving along a straight line is given by $v = 4t^3 - 3t^2 + 2$. Determine the time when the acceleration is zero.

(Total 5 marks)

6. A body moves such that its acceleration is given by $a = 3t + 2$.

If the initial velocity is 4 m/s and initial displacement is 10 m when $t = 0$, find an expression for displacement s(t).

(Total 5 marks)

My Exam Revision

7. A particle moves along a straight path, and its acceleration is given by

$$a = 5t^2 - 3t + 1$$

Find the change in velocity between $t = 2$ and $t = 4$ seconds.

(Total 5 marks)

8. The velocity of a moving particle is given by $v = t^2 - 4t + 6$.

Determine the time interval when the particle is moving in the positive direction.

(Total 5 marks)

My Exam Revision

9. The position of a particle moving along a straight line is given by

$$s = t^4 - 6t^3 + 9t^2$$

Find the time at which the acceleration is equal to zero.

(Total 5 marks)

10. A particle moves such that its velocity is given by $v = 3t^2 - 2t$.

Find the total distance travelled in the first 5 seconds.

(Total 5 marks)

My Exam Revision