

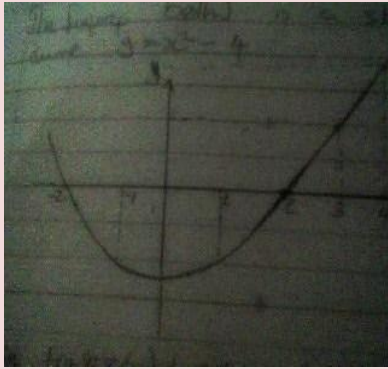
FORM FOUR TOPICAL CAT QUESTIONS

MATHEMATICS

1. The velocity  $v$  m/s of a particle initially 5m from a fixed point is given by  $v=3t^2-2t+4$ . Find

- a) acceleration when  $t=2$  seconds (2mks)
- b) position of the O when  $t=3$  seconds (3mks)
- c) Time when the velocity is maximum (3mks)
- d) Maximum velocity (2mks)

2. The figure below is a sketch of the curve  $y=x^2-4$



- a) Using trapezoidal rule with six steps estimate the area bounded by the curve, the x-axis and the lines  $x=-2$  and  $x=4$  (4mks)
- b) Calculate the area above by integration (4mks)
- c) Assuming the area found by the integration is exact, calculate the percentage error in trapezoidal rule (2mks)

3. Find the equation of tangent and normal to

- a) a curve  $Y=X^2+4x+4$  when it passes through the point  $p(2,3)$  (5mks)
- b) A particle moves in a straight line with a velocity of 10m/s. After time  $t$  its acceleration  $a$  is given as  $a=2t^3-3t^2+5$ . Find the velocity and displacement when  $t=3$ s (5mks)