

Name \_\_\_\_\_

*Print out and use this as a cover sheet for your hand-written answers.*

1. Explain why in Special Relativity anything that has mass when at rest cannot reach the speed of light.

[3.3 Energy &  $E=mc^2$ ]

2. What is rest energy? Illustrate your answer with examples that show the large amounts of rest energy that can be liberated.

[3.3 Energy &  $E=mc^2$ ]

3. On space-time diagrams with  $x, y$ , space and  $t$  time axes (use a ruler!), sketch the world-line of

- a) a single beam of light moving in the  $x$ -space direction (not a flash that sends beams in all directions).

- b) an object accelerating in the  $x$ -space direction

- c) an object moving in a circle in the  $x$ - $y$  space directions

[3.4 Space-Time]