Criteria A

Q1

96 N

Deduct points for not writing units

Q2
225 m

correct use of area under the curve.

Q3
-0.9 m/s^2

Q4
C

velocity is not changing

accept speed for velocity

accept speed is constant (9 m/s) accept not decelerating

accept not accelerating

accept reached terminal velocity

forces must be balanced

accept forces are equal

accept arrows are the same length / size

or

resultant force is zero

do not accept the arrows are equal

Criteria B

Q1
independent variable- Launch angle

dependent variable - Range of flight

any two controlled variables:- air rocket, initial launching speed, air resistance or any relevant variable.

Q2

Launch angle (°)	Flight range (m)

Q3
appropriate method for collecting data and its analysis.

Q4
90 °

Criteria C

Q1
YES

marks are for the explanation

any two from:

- **data (from police files) can be trusted**
- **data answers the question asked allow a conclusion can be made from the data**

large sample used NO

any two from:

- **the sample is not representative**
- **the sample size is too small**
- **accident files do not indicate age / experience of riders**

any answer YES and NO support logical points.

Q2
more accidents with motorbikes up to 125 cc

accept an answer in terms of number of under 125 cc to accidents ratio compared correctly with number of over 500 cc to accidents ratio

even though there are fewer of these bikes than bikes over 500 cc

q3
YES

any sensible reason, eg:

- **cannot put a price on life / injury accept may save lives**
- **fewer (serious) injuries accept reduces risk of injury**
- **reduces cost of health care / compensation**

NO

any sensible suggestion, eg:

- **money better spent on … needs to be specific**
- **total number of riders involved is small**

Criteria D

Inflatable seat belt

Proper use of momentum concept.

More time of contact, less impact/ force.

Wrong if students say impulse change or less.