

# Master Maths 10 Worksheet 40

## Variation 3

# 40

**Name:** \_\_\_\_\_

1. Match the equations below with the different types of variation relationships.

- A** - direct linear variation
- B** - direct quadratic variation
- C** - exponential variation
- D** - partial variation
- E** - inverse variation

$y = kx$      $y = kn^x$      $y = \frac{k}{x}$      $y = kx + c$      $y = kx^2$

2. Balls with different masses ( $m$ ), in kg, are projected vertically up by a catapult and the heights ( $H$ ), in metres, attained are recorded in this table.

$m$ (kg)	0.5	2	4	8
$H$ (m)	16	4	2	1

(a) Which of the variation types (**A-E** from question 1) apply to the relationship between  $m$  and  $H$ ?

(b) Find all the constant values in this relationship and write the equation.

(c) What height would be attained by a 0.2 kg mass?

(d) What was the mass of a ball that attained a height of 0.8 metres?

3. The number of bacteria ( $N$ ) on a food sample was recorded every hour ( $t$ ) after 20 were observed. The results are shown in the table below.

$t$ (hr)	0	1	2	3	4
$N$	20	40	80	160	320

(a) Which of the variation types (**A-E** from question 1) apply to the relationship between  $t$  and  $N$ ?

(b) Find all the constant values in this relationship and write the equation.

(c) How many bacteria will be present on the food after 10 hours?

(d) After how many hours will there be more than 20 million bacteria?