## Review of Homework

- The cost of serving tea and biscuits varies directly with the square root of the number of people at the buffet. It costs £25 to serve tea and biscuits to 100 people.
  - a How much will it cost to serve tea and biscuits to 400 people?
  - For a cost of £37.50, how many could be served tea and biscuits?

$$C = 2.5\sqrt{400}$$
  
 $C = 2.5 \times 20$   
 $C = 450$ 

$$\frac{37.56}{2.5} = \sqrt{P}$$

$$15 = \sqrt{P}$$

$$15^{2} = P$$

$$P = 225$$

225 people

- In an experiment, the temperature, in °C, varied directly with the square of the pressure, in atmospheres. The temperature was 20 °C when the pressure was 5 atm.
  - What will the temperature be at 2 atm?
- **b** What will the pressure be at 80 °C?

P = 10 atm

$$C = KP^{2}$$
 $C = 20$ 
 $20 = K \times 5^{2}$ 
 $20 = 25K$ 
 $20 = 6$ 
 $25 = 6$ 
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a) 
$$P = 2 \Rightarrow C = 0.8 \times 2^{2}$$
  
 $C = 3.2^{\circ} C$ 

b) 
$$C = 80$$
  $80 = 0.8 P^{2}$   $\frac{80}{0.8} = P^{2}$   $100 = P^{2}$   $P = \sqrt{108}$ 

The weight, in grams, of ball bearings varies directly with the cube of the radius measured in millimetres. A ball bearing of radius 4 mm has a weight of 115.2 g.

- What will a ball bearing of radius 6 mm weigh?
- A ball bearing has a weight of 48.6 g. What is its radius?

$$V = K r^{3}$$

$$\begin{cases} r = 4 \\ w = 115.2 \\ 115.2 \\ = 64 \\ K = 1.8 \end{cases}$$

$$W = 1.8 r^{3}$$

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$$W = 388.8 s$$

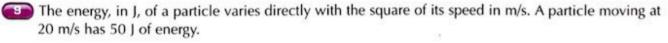
$$48.6 = 1.8$$
 (3)
$$\frac{48.6}{1.8} = 1.8$$

$$27 = 1.8$$

$$3\sqrt{27} = 1.8$$

$$x = 3$$





- How much energy has a particle moving at 4 m/s?
- At what speed is a particle moving if it has 200 J of energy?

$$E = KV^{2}$$

$$V = 20$$

$$S0 = K \times 20^{3}$$

$$E = 50$$

$$\frac{50}{400} = K$$

$$K = \frac{1}{8}$$

$$E = \frac{\sqrt{2}}{8}$$

4) When 
$$V=4$$
  $E=\frac{4^2}{8}=\frac{16}{8}=2$ j

5) When 
$$E = 200$$

$$1600 = v^{2}$$

$$\sqrt{1600} = V$$

$$V = 40 \text{ ms}^{-1}$$

- The cost, in £, of a trip varies directly with the square root of the number of miles travelled. The cost of a 100-mile trip is £35.
  - a What is the cost of a 500-mile trip (to the nearest £1)?
  - What is the distance of a trip costing £70?

$$C = K \int M$$

$$C = K \int I = 35$$

$$35 = 10 K$$

$$3.5 = K$$

$$C = 3.5 \int M$$

b) then
$$70 = 3.5 \text{ Jm}$$

$$\frac{70}{3.5} = \text{Jm}$$

$$20 = \text{Jm}$$

$$20^{2} = \text{m}$$

$$m = 400 \text{ miles}$$

## **Inverse Proportion**

Inverse propostion involves one variable increasing as the other decreases

Ex Gravitational Force and Distance between objects

Example

T is inversely propostronal to m

If T = C when n = 2, find the following

a) 
$$T$$
 when  $m=4$  b)  $n$  when  $T=4.8$ 

$$T = \frac{k}{m}$$

$$6 = \frac{k}{2}$$

$$12 = k$$

$$T = \frac{12}{m}$$

$$4.8 = \frac{12}{m}$$

$$m = \frac{12}{4 \cdot 8}$$

$$m = 2.5$$

$$M = \frac{36}{t^2}$$

a) when 
$$t = 3$$

$$M = \frac{36}{7^2}$$

$$1.44t = 36$$
 $6^2 = 36$ 

$$e^{2} = 25$$
  
 $t = \sqrt{25}$   
 $t = +5$