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| **S3 National 5 Homework Exercise 13** | C:\Users\Ian\Pictures\CHS.jpg |
|  |
| **Similarity** |
|  |
| Issued by: |  | Return by: |  |
|  |
| **1.** | Explain why all circles and squares are similar, but not all rectangles. |
|  |  |
| **2.** | Find the missing side in each diagram (triangles are similar in each case). |
|  |  |
|  |  | 9cm6cm15cm*a* |  | 35°*b*35°21mm7mm35mm |
|  |  | *c*20cm8cm24cm |  | 12m9m10.5m16m*d* |
|  |
| **3.** | ABDCE3.5m10.5m | • AB and DE are parallel |
|  |  |
|  | • AB = 3.5m and DE = 10.5m |
|  |  |
|  | • BD = 20m |
|  |  |
|  | Find the length of BC. |
|  |  |
|  |  |
|  | **HINT:** find the ratio of BC:CD |
|  |  |
|  |
| **4.** | A Spider-Man poster is available in three sizes, all of which are mathematically similar. |  |  |  |
|  |  |
|  | a) | The small poster has an area of 900cm2 |
|  |  |
|  |  | Find the area of the medium poster. |
|  |  |  |
|  | b) | The large poster has an **area** of 14400cm2. Find its width. |
|  |  | Small (20cm wide) |  | Medium (30cm wide) |
|  |
| **5.** | Cups of Bovril are mathematically similar. Small, medium and large cups are available. | 254241277a6255615320m |
|  |  |
|  | The **medium** cup has a base 6cm across, and holds 300ml of liquid. |
|  |  |
|  | a) | To the nearest ml, find the volume of the **small** cup, given that its base is 5cm across. |
|  |  |  |
|  | b) | If the **large** cup holds 500ml of liquid, find the width of its base (to the nearest mm). |
|  |  |  |

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|  | **Award 1 Mark for each ●** |
|  |  |
| **1.** | Accept any three appropriate comments, e.g.:● In squares all sides are equal so stay in the same ratio whatever the scale● Circles are perfectly symmetrical in all directions● Rectangles can have sides in different proportions to other rectangles. |
|  |  |  |  |  |  |  |  |  |
| **2.** | a) | ●  | b) | ●  | c) | ●  | d) | ●  |
|  |  | ● a = 10cm |  | ● b = 4.2mm |  | ● c = 15cm |  | ● d = 14m |
|  |  |  |  |  |  |  |  |  |
| **3.** | ●  | OR | ●  |
|  | ● Divides BD in ratio 1:3 | ● 10.5x = 70 – 3.5x |
|  | ● BC = 5m | ● BC = 5m |
|  |  |
| **4.** | a) | ● SF = 1.5 | b) | ● 14400 = 900 x (SF)2 | OR | ● 14400 =2025 x (SF)2 |
|  |  | ● Area = 900 x (1.5)2 |  | ● SF =  | OR | ● SF =  |
|  |  | ● 2025cm2 |  | ● SF = 4 | OR | ● SF =  (or equivalent) |
|  |  |  |  | ● 20 x 4 = 80cm | OR | ● 30 x  = 80cm |
|  |  |  |  |  |  |  |
| **5.** | a) | ● Volume = 300 x (SF)3 | b) | ● 500 = 300 x (SF)3 |
|  |  | ● Volume = 300 x  |  | ● SF =  |
|  |  | ● V = 173.61111111 |  | ● x = 6 x  |
|  |  | ● V = 174ml |  | ● x = 7.1137866069… |
|  |  |  |  | ● x = 7.1cm |
|  |
| **Total = 30 marks** |
|  |  |  |  |  |