[core:maths]
A NEW QUALIFICATION FOR WORK, STUDY & LIFE

Godalming College

1)

$7.2^2 + 9.6^2 (= 51.84 + 92.16) = 144$ and $\sqrt{144} = 12$ or $12^2 = 144$	B2	B1 7.2^2 and 9.6^2 oe

(2)

2)

10, 10, 16, 23	B2	B1 for 2 criteria met eg 10,10,10, 23 (mode and range) 9,10,10, 22 (mode and range) 10,10,16, 20 (median and mode)

(2)

3)

60×40 or 2400	M1	oe
their 2400 – 2000 or 400 or 2000 – their 2400	M1dep	
$\dfrac{\text{their } 400}{2000}$ (× 100) or 0.2	M1dep	oe
20(%)	A1	

(4)

4)

455 or 465 or 505 or 515 seen	B1	May be implied by 960 or 980
their 455 + their 505 or 960	M1	their 455 must be [450, 460) their 505 must be [500, 510)
26 000 ÷ (455 + 505) or 26 000 ÷ 960 or 27.0833...	M1	Allow 26 005
27	A1	Must be using 26 000 and 960 SC2 26 from 26 000 ÷ 980

(4)

5)

$\dfrac{86}{86 + 37 + 12} \times 30$ or 19.1 or $\dfrac{37}{86 + 37 + 12} \times 30$ or 8.2	M1	
their19 (.1) – their 8(.2)	M1dep	
11	A1	

(3)

6)

Match each worker to one of the 36 outcomes	B1	There should be at least an implicit reference to there being 36 outcomes
Throw the pair of dice and pick the worker that corresponds to the outcome	B1	
Repeat until 6 workers are picked ignoring repeats	B1	

(3)

7)   a) Discrete B1

b) Continuous B1

c) Qualitative B1

(3)

8) **(a)**

Subgroups: Young males Young females Old males Old females	B2	Allow age ranges in place of 'young' and 'old', eg Males aged under 25 Males aged 25+ etc B1 for identifying any four non-overlapping subgroups, eg Under 20 20 – 29 30 – 39 40 and over
Allow this mark if: each quota is between 10 and 90 and the total of the quotas is 200 and the total for males = the total for females	B1	eg quotas: 50 50 50 50

(b)

Question people leaving from different showings/ different cinemas/ at different times	B1	oe
Use convenience sampling to select audience members (and continue until all quotas have been reached)	B1	oe

(c)

Certain types of people are less likely to want to be questioned or the interviewer is more likely to ask people they think will agree to be questioned	B1	oe

(6)

9) a) Assumptions: Model pea as either sphere or cube   M1
Diameter or length between 5mm and 10mm   M1
Model bath as a cuboid   M1
Bath length is 1m to 2m
Bath width is 0.5m to 1m   } M1
Bath height 0.3m to 0.6m

If pea is 10mm (1cm) and bath has smallest dimensions: M1
$(100cm \div 1cm) \times (50cm \div 1cm) \times (30cm \div 1cm) = 150{,}000$ peas

If pea is 5mm (0.5cm) and bath has largest dimensions: M1
$(200cm \div 0.5cm) \times (100cm \div 0.5cm) \times (60cm \div 0.5cm) = $
9,600,000 peas

OR

Volume of pea is between 0.065cm³ (modelled as a sphere with   M1
0.5cm diameter) and 1cm³ (modelled as a cube with 1cm edges)
Volume of bath tub is between 150.000cm³ (smallest dimensions)   M1
and 1,200,000cm³ (largest dimensions)

$1{,}200{,}000 \div 0.065 = 18{,}461{,}538$
$150.000 \div 1 = 150{,}000$

Answer between 100,000 and 18.500.000   A1

b)   any sensible answer eg:
I modelled peas as a cube, if I modelled as a sphere more would fit,
if the average diameter was larger less peas would fit,
bath tubs are curved in the corners so my answer would be smaller.
etc

B1

(8)

TOTAL: 35