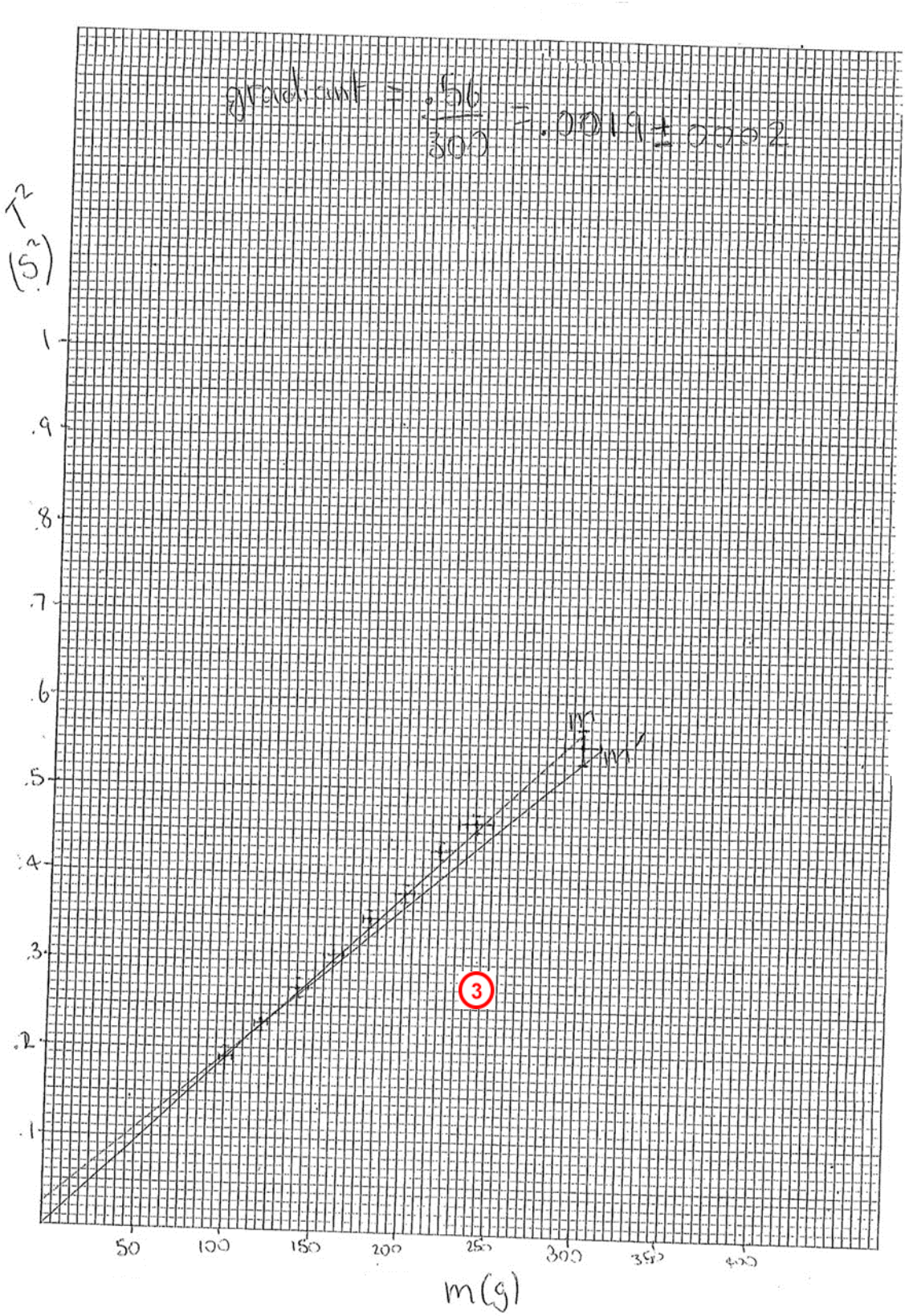
Student 4: High Achieved

NZQA Intended for teacher use only



(1)

m	T for 10 swings				T_{av}	T_{av} for 1 swing	T^2	ΔT (2)	$\%\Delta T$	$\%x2$	ΔT^2	$\%\Delta m$ (2)	Abs Δm (2)
100	4.5	4.4	4.4	4.4	4.4	.44	0.19	.01	2.3	4.6	.01	4%	4
120	4.8	4.8	4.8	4.9	4.8	.48	.23	.01	2.1	4.2	.01	4%	5
140	5.2	5.2	5.3	5.2	5.2	.52	.27	.01	1.9	3.8	.01	4%	6
160	5.6	5.6	~~6.0~~	5.5	5.6	.56	.31	.01	1.8	3.6	.01	4%	6
180	5.8	5.8	5.9	5.9	5.9	.59	.35	.01	1.7	3.4	.01	4%	7
200	6.2	6.2	6.1	6.2	6.2	.62	.38	.01	1.6	3.2	.01	4%	8
220	6.5	6.5	6.4	6.5	6.5	.65	.43	.01	1.5	3	.01	4%	9
240	6.8	6.7	6.8	6.8	6.8	0.68	.46	.01	1.5	3	.01	4%	10
260	7.5	7.4	7.4	7.4	7.4	0.74	.55	.01	1.4	2.8	.02	4%	12

Not $^1/_2$ range

m=0.0019=$\frac{.56}{300}$

m'=0.0017=$\frac{.51}{300}$

k= $\frac{4\pi^2}{m}$ =21,000 2sf

gradient for T^2 against mass in Kg
m=1.87
T^2= 1.87 ± .17 T^2= 1.9 ± 2m (4)

(5) k= $\frac{4\pi^2}{m}$ =21.1 Nm^{-1}

21.1/2.9 x 100 = 73%

K was a constant, my independent variable was T and my dependant one was mass. I did 4 trials for each mass and timed for 10 swings to minimize reactions times, random error and equipment error. I then divided each time by 10 to make it more accurate. My gradient was very different to the given gradient. I think this was because my spring had some bends in and it may have exceeded its elastic constant. I eliminated a result from my raw data because it was far off from all others for that mass I looked on the spring face to avoid parallax error.