Second Year Assignment 17 Version O

1. The table shows data from the large data set on the daily mean air temperature and the daily mean pressure during May and June 2015 in Beijing.

Temperature °C	17.5	18.5	18.0	24.6	22.2	23.1	27.3
Pressure (hPa)	1010	1011	1012	997	1009	998	1002

Test at the 2.5% level of significance the claim that there is negative correlation between the daily mean air temperature and the daily mean pressure. State your hypotheses clearly.

2. A plank AB has length 4 m. It lies on a horizontal platform, with the end A lying on the platform and the end B projecting over the edge, as shown in the diagram. The edge of the platform is at the point C.

Jack and Jill are experimenting with the plank. Jack has mass 48 kg and Jill has mass 36 kg. They discover that if Jack stands at B and Jill stands at A and BC = 1.8 m, the plank is in equilibrium and on the point of tilting about C.
By modelling the plank as a uniform rod, and Jack and Jill as particles, find the mass of the plank.

3. Find the exact value of $\int_{2}^{7} x\sqrt{2 + x}\, dx$

Second Year Assignment 17 Version P

1. The table shows data from the large data set on the daily mean air temperature and the daily mean pressure during May and June 2015 in Beijing.

Temperature °C	17.5	16.5	18.0	24.6	22.2	23.1	27.3
Pressure (hPa)	1010	1011	1012	997	1009	998	991

Test at the 2.5% level of significance the claim that there is negative correlation between the daily mean air temperature and the daily mean pressure. State your hypotheses clearly.

2. A plank AB has length 4 m. It lies on a horizontal platform, with the end A lying on the platform and the end B projecting over the edge, as shown in the diagram. The edge of the platform is at the point C.

Jack and Jill are experimenting with the plank. Jack has mass 50 kg and Jill has mass 36 kg. They discover that if Jack stands at B and Jill stands at A and BC = 1.7 m, the plank is in equilibrium and on the point of tilting about C.
By modelling the plank as a uniform rod, and Jack and Jill as particles, find the mass of the plank.

3. Find the exact value of $\int_{1}^{6} x\sqrt{3 + x}\, dx$

Second Year Assignment 17 Version Q

1. The table shows data from the large data set on the daily mean air temperature and the daily mean pressure during May and June 2015 in Beijing.

Temperature °C	17.5	18.5	18.0	24.6	22.2	23.1	27.3
Pressure (hPa)	1000	1011	1012	997	1009	1010	999

Test at the 2.5% level of significance the claim that there is negative correlation between the daily mean air temperature and the daily mean pressure. State your hypotheses clearly.

2. A plank AB has length 4 m. It lies on a horizontal platform, with the end A lying on the platform and the end B projecting over the edge, as shown in the diagram. The edge of the platform is at the point C.

Jack and Jill are experimenting with the plank. Jack has mass 55 kg and Jill has mass 36 kg. They discover that if Jack stands at B and Jill stands at A and BC = 1.6 m, the plank is in equilibrium and on the point of tilting about C.

By modelling the plank as a uniform rod, and Jack and Jill as particles, find the mass of the plank.

3. Find the exact value of $\int_3^{24} x\sqrt{1+x}\, dx$

Second Year Assignment 17 Version R

1. The table shows data from the large data set on the daily mean air temperature and the daily mean pressure during May and June 2015 in Beijing.

Temperature °C	17	18	19	20	21	22	23
Pressure (hPa)	1010	1005	1000	995	993	991	1000

Test at the 2.5% level of significance the claim that there is negative correlation between the daily mean air temperature and the daily mean pressure. State your hypotheses clearly.

2. A plank AB has length 4 m. It lies on a horizontal platform, with the end A lying on the platform and the end B projecting over the edge, as shown in the diagram. The edge of the platform is at the point C.

Jack and Jill are experimenting with the plank. Jack has mass 65 kg and Jill has mass 36 kg. They discover that if Jack stands at B and Jill stands at A and BC = 1.5 m, the plank is in equilibrium and on the point of tilting about C.

By modelling the plank as a uniform rod, and Jack and Jill as particles, find the mass of the plank.

3. Find the exact value of $\int_5^{12} x\sqrt{4+x}\, dx$

Answers Version O

1. $r = -0.792$ (3 s.f.), $H_0: p = 0, H_1: p < 0$, critical value $- 0.7545$. Reject H_0. There is evidence that temperature and pressure are negatively correlated.

2 36 kg

3 a)$\frac{886}{15}$

Answers Version P

1. $r = -0.923$ (3 s.f.), $H_0: p = 0, H_1: p < 0$, critical value $- 0.7545$. Reject H_0. There is evidence that temperature and pressure are negatively correlated.

2) $\frac{22}{3}$ kg

3 a)$\frac{232}{5}$

Answers Version Q

1. $r = -0.496$ (3 s.f.), $H_0: p = 0, H_1: p < 0$, critical value $- 0.7545$. Accept H_0. There is **no** evidence that temperature and pressure are negatively correlated.

2) 4 kg

3 a)$\frac{5796}{5}$

Answers Version R

1. $r = -0.741$ (3 s.f.), $H_0: p = 0, H_1: p < 0$, critical value $- 0.7545$. Accept H_0. There is **no** evidence that temperature and pressure are negatively correlated.

2) 15 kg

3 a)$\frac{3206}{15}$