Samples	x	y	$x - \bar{x}$	$y - \bar{y}$	$(x - \bar{x})^2$	$(y - \bar{y})^2$	$(x - \bar{x})(y - \bar{y})$
1	15	2289	-2	-715.1	4	511,368.01	1,430.20
2	17	3393	0	388.9	0	151,243.21	-
3	18	3271	1	266.9	1	71,235.61	266.90
4	15	2648	-2	-356.1	4	126,807.21	712.20
5	16	2897	-1	-107.1	1	11,470.41	107.10
6	19	3327	2	322.9	4	104,264.41	645.80
7	17	2970	0	-34.1	0	1,162.81	-
8	16	2535	-1	-469.1	1	220,054.81	469.10
9	18	3138	1	133.9	1	17,929.21	133.90
10	19	3573	2	568.9	4	323,647.21	1,137.80
Total	**170**	**30041**			**20**	**1,539,182.90**	**4,903.00**
Square root					**4.47**	**1,240.64**	
	$\bar{x}$	17					
	$\bar{y}$	3004.1					
	n	10					

Part i)

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2}\sqrt{\sum(y - \bar{y})^2}} = \frac{4903}{4.47\ X\ 1240.64} = 0.88 = 88\%$$

It means strong positive linear relationship between maternal age and birth weight of baby.

Part ii)

$$r^2 = 0.88^2 = 0.77 = 77\%$$

So, 77% of the variability in birth weight of baby can be explained by the variability of maternal age.

Part iii)

$$S_y = \sqrt{\frac{\sum(y - \bar{y})^2}{(n-1)}} = \sqrt{\frac{1{,}539{,}182.90}{(10-1)}} = \sqrt{171{,}020.32} = 413.55$$

$$S_x = \sqrt{\frac{\sum(x - \bar{x})^2}{(n-1)}} = \sqrt{\frac{20}{(10-1)}} = \sqrt{2.2} = 1.49$$

$$\beta_1 = r\,\frac{S_y}{S_x} = 0.88\ \frac{413.55}{1.49} = 244.24$$

$$\beta_0 = \bar{y} - \beta_1\bar{x} = 3{,}004.1 - 244.24\ X\ 17 = 3{,}004.1 - 4{,}152.08 = -1{,}147.98$$

$$y = \beta_1 x + \beta_0 = 244.24\,x - 1{,}147.98$$

Part iv)

x = 20

$$y = 244.24\ X\ (20)\ - 1{,}147.98$$ = 4,884.8 - 1,147.98 = 3,736.82 grams

x = 40

$$y = 244.24\ X\ (40)\ - 1{,}147.98$$ = 9,769.6 - 1,147.98 = 8,621.62 grams

v). Plot the data and draw a trend line