Equation of regression line & curve

1. A tourist has a pamphlet that contains the following list of taxi fares for various distance. How much should the tourist expect to pay for a cab ride of 18.4 miles?

Miles driven	1	3	5	12
Cost ($)	1.75	3.80	6.50	12.00

2. The accompanying table shows the boiling points of water at different altitudes.

Location	Altitude(km)	Boiling point(°C)
Wellington	0	100
Alberta	1.38	95
Quito	2.85	90
Mt. Logan	5.95	80

a) Find the equation of the regression line
b) Predict to the nearest tenth of a degree the boiling point of water at Tibet, where the altitude is 3.68*km*.

3. The data in the accompanying table show the growth of cellular phone subscriptions in the U.S. from 1993 to 1999.

Year	Subscriptions(millions)
1993	16.00
1995	33.80
1996	44.10
1997	55.30
1999	86.05

a) Fit an exponential curve $y = ab^x$ that best fits the data, where $x = 0$ represents the year 1990 and y is the number of cellular phone subscriber. Approximate a and b to the *nearest thousandth*.
b) Use the model to estimate the number of cellular phone subscriber in 1998.

4. a) Use the data in the accompanying table to find the logarithmic regression equation to the *nearest tenth.*
b) Find to the nearest tenth of an hour the number of hours of sleep required by a 35-year-old.

Age, x(year)	Amount of sleep required, y(hour)
2	13
6	11
12	10
16	9
25	8
50	6

5. Jean invested $380 in stocks. Over the next 5 years, the value of her investment grew, as shown in the accompanying table.

Years Since Investment (x)	Value of Stock, in Dollars (y)
0	380
1	395
2	411
3	427
4	445
5	462

Write the exponential regression equation for this set of data, rounding all values to *two decimal places*.
Using this equation, find the value of her stock, to the *nearest dollar*, 10 years after her initial purchase.

6. The accompanying table shows the number of new cases reported by the Nassau and Suffolk County Police Crime Stoppers program for the years 2000 through 2002.

Year (x)	New Cases (y)
2000	457
2001	369
2002	353

If $x = 1$ represents the year 2000, and y represents the number of new cases, find the equation of best fit using a power regression, rounding all values to the *nearest thousandth*.
Using this equation, find the estimated number of new cases, to the *nearest whole number*, for the year 2007.

7. The breaking strength, y, in tons, of steel cable with diameter d, in inches, is given in the table below.

d (in)	0.50	0.75	1.00	1.25	1.50	1.75
y (tons)	9.85	21.80	38.30	59.20	84.40	114.00

On the accompanying grid, make a scatter plot of these data. Write the exponential regression equation, expressing the regression coefficients to the *nearest tenth.*

8. The table below, created in 1996, shows a history of transit fares from 1955 to 1995. On the accompanying grid, construct a scatter plot where the independent variable is years. State the exponential regression equation with the coefficient and base rounded to the *nearest thousandth.* Using this equation, determine the prediction that should have been made for the year 1998, to the *nearest cent.*

Year	55	60	65	70	75	80	85	90	95
Fare ($)	0.10	0.15	0.20	0.30	0.40	0.60	0.80	1.15	1.50