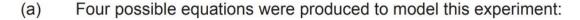
0 11 10	//0
Question 10	(12 marks)

In a laboratory experiment, the population of a particular bacteria began with 400 present. The bacteria grew at a rate of 35% each week, where P is the number of bacteria and t is the number of weeks from the start of the experiment.



$$P = 400(1.35)^t$$

$$P = 400(0.35)^t$$

$$P = 540(1.35)^{t-1}$$

$$P = 540(1.35)^{t+1}$$
.

Circle the correct equation(s).

(2 marks)

(b) Calculate the population of bacteria after three weeks.

(1 mark)

(c) During which week did the population of bacteria first reach 1800?

(2 marks)

(d) After eight weeks the growth rate slowed to 20% each week. How many weeks in total did it take for the population of bacteria to reach 15 812? (3 marks)

(e) What constant weekly growth rate would produce the same change in population from 400 to 15 812 in the same time as found in part (d)? (2 marks)

(f)	Once the bacteria population reached 15 812 it began to die out at a rate of 250 each day. Approximately how many weeks did it take for the bacteria to die out completely? (2 marks)