Statistical test - comparison to sample of regional charity shops

As both samples are small (less than 25), use the t distribution.

Null hypothesis - that there is no statistically significant difference in sales or profit between the CFCT shops and the regional sample shops.

SALES COMPARISON			
Regional data			
No. of shops in sample	24	SN1	P30
Mean sales per shop per week	1426.83		P30
Standard Deviation	539.52		P30
CFCT data			
No. of shops in sample	8	SN2	P30
Mean sales per shop per week	1,036.76		P30
Standard Deviation	237.02		P30
t value	**1.966**		P30
t tables (SN1+SN2 - 2) = 30 degrees of freedom (95% confidence level)	2.042		From tables

PROFIT COMPARISON			
Regional data			
No. of shops in sample	24	PN1	P30
Mean profit per shop	585.21	PM1	P30
Standard Deviation	323.78	PS1	P30
CFCT data			
No. of shops in sample	8	PN2	P30
Total profit (exc cash donations)	95,950		AppB1
Trading year (weeks)	51		P23
Mean profit per shop	235.17	PM2	
Standard deviation	222.21	PS2	Below
Common Standard Error calculation			
PN1 -1	23		
PS1 squared	104,833.49	2,411,170.23	
PN2-1	7		
PS2 squared	49,378.07	345,646.47	
PS1 squared+PS2 squared	2,756,816.70		
PN1 + PN2 -2	30		
Common Standard Error squared	91,893.89		
Common Standard Error	303.14		
Standard Error for sample means			
PM1	61.88		
PM2	107.18		
Sampling error of the distribution squared	15,315.65		
Sampling error of the distribution	123.76		
t value	**2.828**		
t tables (PN1+PN2 - 2) = 30 degrees of freedom (95% confidence level)	2.042		From tables

Statistical test - comparison to sample of regional charity shops (continued)

RESULTS
Sales: there is no significant difference from the regional figures, therefore accept the null hypothesis.
Profit: there is a significant difference from the regional figures, therefore reject the null hypothesis.
Thus the sales of CFCT shops are consistent with the sales in the regional sample, but the profit earned from those sales is significantly lower.
This is consistent with the analysis in Appendix B2 which shows higher rents and managers' salaries, i.e. CFCT shops appear to be more costly to run than the average for shops in the regional sample.

PROFIT - MEAN AND STANDARD DEVIATION				
Shop	**Profit (App B1)**	**Profit per week (51 wks)**	**Difference from mean**	**Difference from mean squared**
	x	x / 51		
Clyde	7,127	139.75	95.43	9,106.21
Cromarty	21,999	431.35	-196.18	38,487.13
Dornoch	7,115	139.51	95.66	9,151.17
Forth	-3,371	-66.10	301.27	90,763.38
Moray	17,195	337.16	-101.99	10,401.00
Pentland	31,004	607.92	-372.75	138,942.56
Solway	13,977	274.06	-38.89	1,512.22
Tay	904	17.73	217.45	47,282.80
Total	95,950			345,646.47
Mean		235.17		
Standard deviation		222.21		