Name: KEYc

Participant # _____

2006
North Carolina FFA
Farm Business Management
Career Development Event

Section II: Problem Solving (200 points)

Read each problem carefully. The **main concept** of each problem is stated at the start of each problem. Read the entire problem before beginning work on that problem.

Section II contains <u>nine (9)</u> problems. Check to see that you have <u>14</u> pages including the cover page. Some pages may contain more than one problem. The point value for each of your answers is stated in parenthesis to the right of each blank.

You have <u>100 minutes</u> to complete this section of the Career Development Event.

Problem 1- Investment Analysis or Time Value of Money (24 points)

$$PV = FV / (1 + r)^n$$

PV= Present Value
FV= Future Value
r= interest or discount rate
n= number of years

ROUND-OFF decimals to the
nearest cent ($1594.38775
rounds off to $1594.39)

Use the tables on pages 3-6 or the formula in the box above to calculate the value for each question a. thru d. Write your answer(s) in the blank(s) provided for each question. Show your calculations (use the back of pages if necessary).

a. If land is currently worth $1,750 per acre and is expected to increase in value at a rate of 5% annually, what will the land be worth in <u>5 years</u>?

$ _____ (4 points)

from Table 1 on page 3: $1,750 x 1.2763 = $2,233.52
or by formula: FV = PV * $(1 + r)^n$ = ($1,750) $(1.05)^5$ = $2,233,49

b. If land is currently worth $1,750 per acre and is expected to increase in value at a rate of 5% annually, what will the land be worth in <u>10 years</u>?

$ _____ (4 points)

from Table 1 on page 3: $1,750 x 1.6289 = $2,850.58
or by formula: FV = PV * $(1 + r)^n$ = ($1,750) $(1.05)^{10}$ = $2,850.56

c. If you require a 5% rate of return, how much could you afford to pay for an acre of land which has annual net cash revenues of $60 per acre for 10 years and an expected selling price of $2,500 per acre in 10 years?

+ present value of net cash revenues $ _____ (4 points)

+ present value of expected selling price $ _____ (4 points)

= amount you could afford to pay $ _____ (4 points)

from Table 2 on page 4:   **present value of net cash revenues: $60 * 7.7217 = $ 463.30**
from Table 3 on page 5:   **present value of expected selling price: $2500 * 0.61391 = $1,534.78**
$463.30+ $1,534.78 = $1,998.08

or by the formula: PV = FV / $(1 + r)^n$ = 60/ $(1.05)^1$ + 60/ $(1.05)^2$ + 60/ $(1.05)^3$ +60/ $(1.05)^4$ +60/ $(1.05)^5$ + 60/ $(1.05)^6$ + 60/ $(1.05)^7$ + 60/ $(1.05)^8$ + 60/ $(1.05)^9$ + 60/ $(1.05)^{10}$ + 2500/ $(1.05)^{10}$ = 57.1428 + 54.4217 + 51.8313 + 49.3623 + 47.0145 + 44.7761 + 42.6408 + 40.6118 + 38.6772 + 36.8369 + 1534.8722 = 1998.19

d. Brandon and Rebecca wish to have $50,000 ten years from now as a college fund for their daughter. How much money would have to be invested today at 6% compound interest?

$ _____ (4 points)

from Table 3 on page 5: $50,000 * 0.5583 = $27,919.50
of by the formula: PV = FV / $(1 + r)^n$ = 50000 / $(1.06)^{10}$ = 50000 / 1.7908 = $27,920.48
[difference is due to rounding of calculations]

Table 1- Future Value of a $1 Investment

Years	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%	9.5%	10%
1	1.0400	1.0450	1.0500	1.0550	1.0600	1.0650	1.0700	1.0750	1.0800	1.0850	1.0900	1.0950	1.1000
2	1.0816	1.0920	1.1025	1.1130	1.1236	1.1342	1.1449	1.1556	1.1664	1.1772	1.1881	1.1990	1.2100
3	1.1249	1.1412	1.1576	1.1742	1.1910	1.2079	1.2250	1.2423	1.2597	1.2773	1.2950	1.3129	1.3310
4	1.1699	1.1925	1.2155	1.2388	1.2625	1.2865	1.3108	1.3355	1.3605	1.3859	1.4116	1.4377	1.4641
5	1.2167	1.2462	1.2763	1.3070	1.3382	1.3701	1.4026	1.4356	1.4693	1.5037	1.5386	1.5742	1.6105
6	1.2653	1.3023	1.3401	1.3788	1.4185	1.4591	1.5007	1.5433	1.5869	1.6315	1.6771	1.7238	1.7716
7	1.3159	1.3609	1.4071	1.4547	1.5036	1.5540	1.6058	1.6590	1.7138	1.7701	1.8280	1.8876	1.9487
8	1.3686	1.4221	1.4775	1.5347	1.5938	1.6550	1.7182	1.7835	1.8509	1.9206	1.9926	2.0669	2.1436
9	1.4233	1.4861	1.5513	1.6191	1.6895	1.7626	1.8385	1.9172	1.9990	2.0839	2.1719	2.2632	2.3579
10	1.4802	1.5530	1.6289	1.7081	1.7908	1.8771	1.9672	2.0610	2.1589	2.2610	2.3674	2.4782	2.5937
11	1.5395	1.6229	1.7103	1.8021	1.8983	1.9992	2.1049	2.2156	2.3316	2.4532	2.5804	2.7137	2.8531
12	1.6010	1.6959	1.7959	1.9012	2.0122	2.1291	2.2522	2.3818	2.5182	2.6617	2.8127	2.9715	3.1384
13	1.6651	1.7722	1.8856	2.0058	2.1329	2.2675	2.4098	2.5604	2.7196	2.8879	3.0658	3.2537	3.4523
14	1.7317	1.8519	1.9799	2.1161	2.2609	2.4149	2.5785	2.7524	2.9372	3.1334	3.3417	3.5629	3.7975
15	1.8009	1.9353	2.0789	2.2325	2.3966	2.5718	2.7590	2.9589	3.1722	3.3997	3.6425	3.9013	4.1772
16	1.8730	2.0224	2.1829	2.3553	2.5404	2.7390	2.9522	3.1808	3.4259	3.6887	3.9703	4.2719	4.5950
17	1.9479	2.1134	2.2920	2.4848	2.6928	2.9170	3.1588	3.4194	3.7000	4.0023	4.3276	4.6778	5.0545
18	2.0258	2.2085	2.4066	2.6215	2.8543	3.1067	3.3799	3.6758	3.9960	4.3425	4.7171	5.1222	5.5599
19	2.1068	2.3079	2.5270	2.7656	3.0256	3.3086	3.6165	3.9515	4.3157	4.7116	5.1417	5.6088	6.1159
20	2.1911	2.4117	2.6533	2.9178	3.2071	3.5236	3.8697	4.2479	4.6610	5.1120	5.6044	6.1416	6.7275
21	2.2788	2.5202	2.7860	3.0782	3.3996	3.7527	4.1406	4.5664	5.0338	5.5466	6.1088	6.7251	7.4002
22	2.3699	2.6337	2.9253	3.2475	3.6035	3.9966	4.4304	4.9089	5.4365	6.0180	6.6586	7.3639	8.1403
23	2.4647	2.7522	3.0715	3.4262	3.8197	4.2564	4.7405	5.2771	5.8715	6.5296	7.2579	8.0635	8.9543
24	2.5633	2.8760	3.2251	3.6146	4.0489	4.5331	5.0724	5.6729	6.3412	7.0846	7.9111	8.8296	9.8497
25	2.6658	3.0054	3.3864	3.8134	4.2919	4.8277	5.4274	6.0983	6.8485	7.6868	8.6231	9.6684	10.8347
30	3.2434	3.7453	4.3219	4.9840	5.7435	6.6144	7.6123	8.7550	10.0627	11.5583	13.2677	15.2203	17.4494
35	3.9461	4.6673	5.5160	6.5138	7.6861	9.0623	10.6766	12.5689	14.7853	17.3796	20.4140	23.9604	28.1024
40	4.8010	5.8164	7.0400	8.5133	10.2857	12.4161	14.9745	18.0442	21.7245	26.1330	31.4094	37.7194	45.2593

Table 2- Future Value of a $1 Annuity

Years	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%	9.5%	10%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0400	2.0450	2.0500	2.0550	2.0600	2.0650	2.0700	2.0750	2.0800	2.0850	2.0900	2.0950	2.1000
3	3.1216	3.1370	3.1525	3.1680	3.1836	3.1992	3.2149	3.2306	3.2464	3.2622	3.2781	3.2940	3.3100
4	4.2465	4.2782	4.3101	4.3423	4.3746	4.4072	4.4399	4.4729	4.5061	4.5395	4.5731	4.6070	4.6410
5	5.4163	5.4707	5.5256	5.5811	5.6371	5.6936	5.7507	5.8084	5.8666	5.9254	5.9847	6.0446	6.1051
6	6.6330	6.7169	6.8019	6.8881	6.9753	7.0637	7.1533	7.2440	7.3359	7.4290	7.5233	7.6189	7.7156
7	7.8983	8.0192	8.1420	8.2669	8.3938	8.5229	8.6540	8.7873	8.9228	9.0605	9.2004	9.3426	9.4872
8	9.2142	9.3800	9.5491	9.7216	9.8975	10.0769	10.2598	10.4464	10.6366	10.8306	11.0285	11.2302	11.4359
9	10.5828	10.8021	11.0266	11.2563	11.4913	11.7319	11.9780	12.2298	12.4876	12.7512	13.0210	13.2971	13.5795
10	12.0061	12.2882	12.5779	12.8754	13.1808	13.4944	13.8164	14.1471	14.4866	14.8351	15.1929	15.5603	15.9374
11	13.4864	13.8412	14.2068	14.5835	14.9716	15.3716	15.7836	16.2081	16.6455	17.0961	17.5603	18.0385	18.5312
12	15.0258	15.4640	15.9171	16.3856	16.8699	17.3707	17.8885	18.4237	18.9771	19.5492	20.1407	20.7522	21.3843
13	16.6268	17.1599	17.7130	18.2868	18.8821	19.4998	20.1406	20.8055	21.4953	22.2109	22.9534	23.7236	24.5227
14	18.2919	18.9321	19.5986	20.2926	21.0151	21.7673	22.5505	23.3659	24.2149	25.0989	26.0192	26.9774	27.9750
15	20.0236	20.7841	21.5786	22.4087	23.2760	24.1822	25.1290	26.1184	27.1521	28.2323	29.3609	30.5402	31.7725
16	21.8245	22.7193	23.6575	24.6411	25.6725	26.7540	27.8881	29.0772	30.3243	31.6320	33.0034	34.4416	35.9497
17	23.6975	24.7417	25.8404	26.9964	28.2129	29.4930	30.8402	32.2580	33.7502	35.3207	36.9737	38.7135	40.5447
18	25.6454	26.8551	28.1324	29.4812	30.9057	32.4101	33.9990	35.6774	37.4502	39.3230	41.3013	43.3913	45.5992
19	27.6712	29.0636	30.5390	32.1027	33.7600	35.5167	37.3790	39.3532	41.4463	43.6654	46.0185	48.5135	51.1591
20	29.7781	31.3714	33.0660	34.8683	36.7856	38.8253	40.9955	43.3047	45.7620	48.3770	51.1601	54.1222	57.2750
21	31.9692	33.7831	35.7193	37.7861	39.9927	42.3490	44.8652	47.5525	50.4229	53.4891	56.7645	60.2638	64.0025
22	34.2480	36.3034	38.5052	40.8643	43.3923	46.1016	49.0057	52.1190	55.4568	59.0356	62.8733	66.9889	71.4027
23	36.6179	38.9370	41.4305	44.1118	46.9958	50.0982	53.4361	57.0279	60.8933	65.0537	69.5319	74.3529	79.5430
24	39.0826	41.6892	44.5020	47.5380	50.8156	54.3546	58.1767	62.3050	66.7648	71.5832	76.7898	82.4164	88.4973
25	41.6459	44.5652	47.7271	51.1526	54.8645	58.8877	63.2490	67.9779	73.1059	78.6678	84.7009	91.2459	98.3471
30	56.0849	61.0071	66.4388	72.4355	79.0582	86.3749	94.4608	103.3994	113.2832	124.2147	136.3075	149.6875	164.4940
35	73.6522	81.4966	90.3203	100.2514	111.4348	124.0347	138.2369	154.2516	172.3168	192.7017	215.7108	241.6885	271.0244
40	95.0255	107.0303	120.7998	136.6056	154.7620	175.6319	199.6351	227.2565	259.0565	295.6825	337.8824	386.5200	442.5926

Table 3- Present Value of a $1 Lump Sum

Years	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%	9.5%	10%
1	0.96154	0.95694	0.95238	0.94787	0.94340	0.93897	0.93458	0.93023	0.92593	0.92166	0.91743	0.91324	0.90909
2	0.92456	0.91573	0.90703	0.89845	0.89000	0.88166	0.87344	0.86533	0.85734	0.84946	0.84168	0.83401	0.82645
3	0.88900	0.87630	0.86384	0.85161	0.83962	0.82785	0.81630	0.80496	0.79383	0.78291	0.77218	0.76165	0.75131
4	0.85480	0.83856	0.82270	0.80722	0.79209	0.77732	0.76290	0.74880	0.73503	0.72157	0.70843	0.69557	0.68301
5	0.82193	0.80245	0.78353	0.76513	0.74726	0.72988	0.71299	0.69656	0.68058	0.66505	0.64993	0.63523	0.62092
6	0.79031	0.76790	0.74622	0.72525	0.70496	0.68533	0.66634	0.64796	0.63017	0.61295	0.59627	0.58012	0.56447
7	0.75992	0.73483	0.71068	0.68744	0.66506	0.64351	0.62275	0.60275	0.58349	0.56493	0.54703	0.52979	0.51316
8	0.73069	0.70319	0.67684	0.65160	0.62741	0.60423	0.58201	0.56070	0.54027	0.52067	0.50187	0.48382	0.46651
9	0.70259	0.67290	0.64461	0.61763	0.59190	0.56735	0.54393	0.52158	0.50025	0.47988	0.46043	0.44185	0.42410
10	0.67556	0.64393	0.61391	0.58543	0.55839	0.53273	0.50835	0.48519	0.46319	0.44229	0.42241	0.40351	0.38554
11	0.64958	0.61620	0.58468	0.55491	0.52679	0.50021	0.47509	0.45134	0.42888	0.40764	0.38753	0.36851	0.35049
12	0.62460	0.58966	0.55684	0.52598	0.49697	0.46968	0.44401	0.41985	0.39711	0.37570	0.35553	0.33654	0.31863
13	0.60057	0.56427	0.53032	0.49856	0.46884	0.44102	0.41496	0.39056	0.36770	0.34627	0.32618	0.30734	0.28966
14	0.57748	0.53997	0.50507	0.47257	0.44230	0.41410	0.38782	0.36331	0.34046	0.31914	0.29925	0.28067	0.26333
15	0.55526	0.51672	0.48102	0.44793	0.41727	0.38883	0.36245	0.33797	0.31524	0.29414	0.27454	0.25632	0.23939
16	0.53391	0.49447	0.45811	0.42458	0.39365	0.36510	0.33873	0.31439	0.29189	0.27110	0.25187	0.23409	0.21763
17	0.51337	0.47318	0.43630	0.40245	0.37136	0.34281	0.31657	0.29245	0.27027	0.24986	0.23107	0.21378	0.19784
18	0.49363	0.45280	0.41552	0.38147	0.35034	0.32189	0.29586	0.27205	0.25025	0.23028	0.21199	0.19523	0.17986
19	0.47464	0.43330	0.39573	0.36158	0.33051	0.30224	0.27651	0.25307	0.23171	0.21224	0.19449	0.17829	0.16351
20	0.45639	0.41464	0.37689	0.34273	0.31180	0.28380	0.25842	0.23541	0.21455	0.19562	0.17843	0.16282	0.14864
21	0.43883	0.39679	0.35894	0.32486	0.29416	0.26648	0.24151	0.21899	0.19866	0.18029	0.16370	0.14870	0.13513
22	0.42196	0.37970	0.34185	0.30793	0.27751	0.25021	0.22571	0.20371	0.18394	0.16617	0.15018	0.13580	0.12285
23	0.40573	0.36335	0.32557	0.29187	0.26180	0.23494	0.21095	0.18950	0.17032	0.15315	0.13778	0.12402	0.11168
24	0.39012	0.34770	0.31007	0.27666	0.24698	0.22060	0.19715	0.17628	0.15770	0.14115	0.12640	0.11326	0.10153
25	0.37512	0.33273	0.29530	0.26223	0.23300	0.20714	0.18425	0.16398	0.14602	0.13009	0.11597	0.10343	0.09230
30	0.30832	0.26700	0.23138	0.20064	0.17411	0.15119	0.13137	0.11422	0.09938	0.08652	0.07537	0.06570	0.05731
35	0.25342	0.21425	0.18129	0.15352	0.13011	0.11035	0.09366	0.07956	0.06763	0.05754	0.04899	0.04174	0.03558
40	0.20829	0.17193	0.14205	0.11746	0.09722	0.08054	0.06678	0.05542	0.04603	0.03827	0.03184	0.02651	0.02209

Table 4- Present Value of a $1 Annuity

Years	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%	9.5%	10%
1	0.9615	0.9569	0.9524	0.9479	0.9434	0.9390	0.9346	0.9302	0.9259	0.9217	0.9174	0.9132	0.9091
2	1.8861	1.8727	1.8594	1.8463	1.8334	1.8206	1.8080	1.7956	1.7833	1.7711	1.7591	1.7473	1.7355
3	2.7751	2.7490	2.7232	2.6979	2.6730	2.6485	2.6243	2.6005	2.5771	2.5540	2.5313	2.5089	2.4869
4	3.6299	3.5875	3.5460	3.5052	3.4651	3.4258	3.3872	3.3493	3.3121	3.2756	3.2397	3.2045	3.1699
5	4.4518	4.3900	4.3295	4.2703	4.2124	4.1557	4.1002	4.0459	3.9927	3.9406	3.8897	3.8397	3.7908
6	5.2421	5.1579	5.0757	4.9955	4.9173	4.8410	4.7665	4.6938	4.6229	4.5536	4.4859	4.4198	4.3553
7	6.0021	5.8927	5.7864	5.6830	5.5824	5.4845	5.3893	5.2966	5.2064	5.1185	5.0330	4.9496	4.8684
8	6.7327	6.5959	6.4632	6.3346	6.2098	6.0888	5.9713	5.8573	5.7466	5.6392	5.5348	5.4334	5.3349
9	7.4353	7.2688	7.1078	6.9522	6.8017	6.6561	6.5152	6.3789	6.2469	6.1191	5.9952	5.8753	5.7590
10	8.1109	7.9127	7.7217	7.5376	7.3601	7.1888	7.0236	6.8641	6.7101	6.5613	6.4177	6.2788	6.1446
11	8.7605	8.5289	8.3064	8.0925	7.8869	7.6890	7.4987	7.3154	7.1390	6.9690	6.8052	6.6473	6.4951
12	9.3851	9.1186	8.8633	8.6185	8.3838	8.1587	7.9427	7.7353	7.5361	7.3447	7.1607	6.9838	6.8137
13	9.9856	9.6829	9.3936	9.1171	8.8527	8.5997	8.3577	8.1258	7.9038	7.6910	7.4869	7.2912	7.1034
14	10.5631	10.2228	9.8986	9.5896	9.2950	9.0138	8.7455	8.4892	8.2442	8.0101	7.7862	7.5719	7.3667
15	11.1184	10.7395	10.3797	10.0376	9.7122	9.4027	9.1079	8.8271	8.5595	8.3042	8.0607	7.8282	7.6061
16	11.6523	11.2340	10.8378	10.4622	10.1059	9.7678	9.4466	9.1415	8.8514	8.5753	8.3126	8.0623	7.8237
17	12.1657	11.7072	11.2741	10.8646	10.4773	10.1106	9.7632	9.4340	9.1216	8.8252	8.5436	8.2760	8.0216
18	12.6593	12.1600	11.6896	11.2461	10.8276	10.4325	10.0591	9.7060	9.3719	9.0555	8.7556	8.4713	8.2014
19	13.1339	12.5933	12.0853	11.6077	11.1581	10.7347	10.3356	9.9591	9.6036	9.2677	8.9501	8.6496	8.3649
20	13.5903	13.0079	12.4622	11.9504	11.4699	11.0185	10.5940	10.1945	9.8181	9.4633	9.1285	8.8124	8.5136
21	14.0292	13.4047	12.8212	12.2752	11.7641	11.2850	10.8355	10.4135	10.0168	9.6436	9.2922	8.9611	8.6487
22	14.4511	13.7844	13.1630	12.5632	12.0416	11.5352	11.0612	10.6172	10.2007	9.8098	9.4424	9.0969	8.7715
23	14.8568	14.1478	13.4886	12.8750	12.3034	11.7701	11.2722	10.8067	10.3711	9.9629	9.5802	9.2209	8.8832
24	15.2470	14.4955	13.7986	13.1517	12.5504	11.9907	11.4693	10.9830	10.5288	10.1041	9.7066	9.3341	8.9847
25	15.6221	14.8282	14.0939	13.4139	12.7834	12.1979	11.6536	11.1469	10.6748	10.2342	9.8226	9.4376	9.0770
30	17.2920	16.2889	15.3725	14.5337	13.7648	13.0587	12.4090	11.8104	11.2578	10.7468	10.2737	9.8347	9.4269
35	18.6646	17.4610	16.3742	15.3906	14.4982	13.6870	12.9477	12.2725	11.6546	11.0878	10.5668	10.0870	9.6442
40	19.7928	18.4016	17.1591	16.0461	15.0463	14.1455	13.3317	12.5944	11.9246	11.3145	10.7574	10.2472	9.7791

Problem 2- Farm Business Analysis (25 points)

Use the following data to calculate the profitability and efficiency measures listed below. **Show your calculations. [Note: Round answers to two decimal places.]**

Gross revenue	$185,000
Value of farm production	$167,000
Net farm income	$ 48,000
Interest expense	$ 18,000
Value of unpaid labor	$ 31,000
Opportunity cost on farm equity	$ 17,300
Total asset value: Beginning	$400,000
Ending	$430,000
Farm equity: Beginning	$340,000
Ending	$352,000

a. Rate of return on assets _____%

(48,000 + 18,000 – 31,000) / [(400,000 + 430,000/2] = (35,000 / 415,000) = 8.43%

b. Rate of return on equity _____%

(48,000 – 31,000) / [(340,000 + 352,000) / 2] = (17,000 / 346,000) = 4.91%

c. Asset turnover ratio _____

185,000 / [(400,000 +430,000) / 2] = (185,000 / 415,000) = .45

d. Return to management $_____

$48,000 - 31,000 - $17,300 = $ -300

e. Net farm income from operations ratio _____

(48,000 / 185,000) = .26

Problem 3- Machinery Investment Analysis (25 points)

Barlowe Farms owns and operates a tractor used on 250 acres. The ownership cost for the tractors is $2,000 per year plus operating costs of $5.00 per acre including labor. Leasing a tractor with a field capacity of 2.5 acres per hour to do the same work would cost $25 per hour, plus the same operating costs. Hiring the work done on a custom basis would cost $12 per acre.

Calculate the total cost of Alternative 1: **Own and operate the tractor.**
Show your work

       Total Cost of Alternative 1 $_____(7 points)

              $2,000 + ($5.00 * 250 acres) = $3,250

Calculate the total cost of Alternative 2: **Lease the tractor**
Show your work

       Total Cost of Alternative 2 $_____(7 points)

          [$25.00 * (250 acres/ 2.5 acres per hour)] + ($5.00 * 250 acres) = $3,750

Calculate the total cost of Alternative 3: **Hire the work done on a custom basis**
Show your work

       Total Cost of Alternative 3 $_____(7 points)

              $12.00 * 250 acres = $3,000

Which one of the three alternatives has the lowest total cost?
[check one] (4 points)

              _____ Own and operate the tractor

              _____ Lease the tractor

              _____ Hire the work done on a custom basis

              ANS: Hire the work done has the lowest total cost

Problem 4- Types of Farm Business Organization (10 points)

Jason is renting 160 cares from a neighbor to grow soybeans, and uses Mom and Dad's machinery and fuel to farm it. Mom and Dad also supply all the seed, fertilizer, pesticides, and other operating costs. Jason provides all the labor, and will pay the cash rent when the soybean crop is harvested.

Calculate what percent of the crop Jason should keep and what percent he should give to Mom and Dad? **Write your answers in the two blanks in the table below.**

Costs from a soybean enterprise budget.

Cost	Total	Jason's share of cost	Mom and Dad's share of cost
Machinery	$ 65.00	$0.00	$ 65.00
Seed, fertilizer, pesticides, etc.	113.00	0.00	113.00
Labor	18.00	18.00	0.00
Land	72.00	72.00	0.00
TOTAL	**$268.00**	**$90.00**	**$178.00**
	100%	Percent of the soybean crop that Jason should keep **34%** _____% (5 points)	Percent of the soybean crop that Jason should give to his Mom and Dad **66%** _____% (5 points)

Problem 5- Enterprise Budgeting (15 points)

For Barlowe Farms, an enterprise budget for soybeans shows a yield of 36 bushels, a selling price of $5.58 per bushel, and total costs of $220.00 per acre. **Note: Show your calculations and round answers to two decimal places.**

a. What is the **cost of production** per bushel?

$_____ per bushel (5 points)

$220 / 36 bushels = $6.11

b. What is the **break even yield**?

_____ bushels per acre (5 points)

$220 / $5.58 = 39.43

b. What is the **break even price**?

$_____ per bushel (5 points)

$220 / 36 bushels = $6.11

Problem 6- Costs (27 points)

1. For each of the following items from the farm business records of Barlowe Farms, indicate if it is a **fixed or variable cost** AND if it is a **cash or non-cash expense**. **Mark your answers with an X.** (1 point each)

	Fixed Cost	Variable Cost	Cash Expense	Non-cash Expense
Gasoline and oil		X	X	
Depreciation	X			X
Property taxes	X		X	
Labor hired on an hourly basis		X	X	
Insurance premiums	X		X	
Electricity		X	X	

2. Gerald has just purchased a new combine. He has calculated total fixed costs to be $10,500 per year and estimates variable costs will be $8.50 per acre. **Note: Show your calculations and round answers to two decimal places.**

   a. What will his **average fixed cost per acre** be if he combines 1,000 acres per year?

   $_____ per acre (5 points)

   $10,500 / 1,000 acres = $10.50

   b. What is the additional cost of combining an additional acre?

   $_____ (5 points)

   **Since the total fixed cost will not change,
   the only additional cost is the variable cost of $8.50 per acre.**

   c. Gerald plans to use the combine only for custom work on 900 acres per year. How much should he charge per acre to be sure that all costs are covered?

   $_____ per acre (5 points)

   ($10,500 / 900 acres) + $8.50 = $20.17

Problem 7- Balance Sheet and Its Analysis (25 points)

For Barlowe Farms the Current ratio = 2.0 and the Debt/Equity ratio = 1.0
Use your knowledge of balance sheets and ratio analysis to complete the following abbreviated balance sheet.
Calculate and write the correct number in the five blanks in the table below.

> **Helpful Hint**
> The **current ratio** is a measure of liquidity. It determines the ability of the farm business to meet short-term debt and other obligations from available cash. It's the ratio of current assets to current liabilities.
>
> The **debt/equity ratio** is a measure of solvency. It's the ratio of total liabilities to owner's equity.

Assets		Liabilities	
Current assets	$80,000	Current liabilities	$_____ (5 points)
Non-current assets	$_____ (5 points)	Non-current liabilities	$_____ (5 points)
		Total liabilities	$_____ (5 points)
		Owner's equity	100,000
Total assets	$200,000	Total liabilities + equity	$_____ (5 points)

A current ratio of 2.0 means that current assets are twice current liabilities. So the later must be $40,000.

With a debt/equity ratio of 1.0, total liabilities must be the same as equity or $100,000.

Non-current liabilities are found by subtracting current liabilities from total liabilities (or $100,000 – 40,000 = $60,000).

Next, total liabilities plus equity can be found by addition ($100,000 + $100,000 = $200,000).

Finally non-current assets can be found by subtracting current from total assets ($200,000- 80,000 = $120,000).

Problem 8- Enterprise Budget (24 points)

Use the following alfalfa enterprise budget to answer Questions 1 through 6. (4 points each).

ALFALFA HAY
irrigated, circular sprinkler, all equipment owned, conventional bale

_____

Operating Inputs	Units	Price	Quantity	Value	Your Value
Establishment, prorate	Ac	131.380	.200	$26.30	_____
Insecticide	Ac	13.500	1.660	22.41	_____
Phosphorus (P205)	Lbs	0.110	100.000	11.00	_____
Rent fertilizer spreader/ac.	Ac	2.440	1.000	2.44	_____
Baling wire	Bale	.120	195.000	23.40	_____
Annual operating capital	$	.105	11.163	1.18	_____
Machinery labor	Hr	6.000	3.215	19.29	_____
Irrigation labor	Hr	6.000	1.775	10.65	_____
Mach. fuel, lube, repairs	$			39.56	_____
Irrig. fuel, lube, repairs	$			131.67	_____
Total operating costs				$287.90	_____

Fixed costs		Amount	Value	
Machinery:				
Interest at 10.675%		346.90	37.03	_____
Depreciation, taxes, insurance			41.61	_____
Irrigation equipment:				
Interest at 10.675%		485.34	51.81	_____
Depreciation, taxes, insurance			42.90	_____
Total fixed costs			$173.35	_____

Production	Units	Price	Quantity	Value	
Alfalfa hay	Tons	70.00	6.50	455.00	_____
Total receipts				$455.00	

	Value	
Returns above total operating costs	$167.10	_____
Returns above all specified costs	($6.25)	_____

_____

1. Total operating cost per acre is

    A. $461.25
    B.. $287.90
    C. $173.35
    D. $167.10

2. The return above total operating cost per acre is

    A. $461.25
    B.. $287.90
    C. $173.35
    D. $167.10

Problem 8 continued-

3. How many hours of labor are budgeted per acre?

    A. 6.000
    B. 4.990
    C. 3.215
    D. 1.775

4. How many tons of hay is produced in a 40-acre field?

    A. 13,000
    B. 455
    C. 260
    D. 70

Some adjustments need to be made to the budget. Fertilizer and labor costs are too low.

5. If fertilizer (P205) costs 25 cents per pound and spreading costs $3.50 per acre, how much will per acre costs increase?

    A. $9.56
    B. $11.00
    C. $14.00
    D. $15.06

6. If labor costs increases to $8 per hour, what will be the expected per acre return over all specified costs? (ignore changes in capital costs.)

    A. ($6.25)
    B. ($8.25)
    C. ($9.98)
    D. ($16.23)

Problem 9- Partial Budgeting (25 points)

A neighbor has offered to custom cut, bale and haul hay for the Barlowe Farms for $62 per ton. Assume the quality of the hay does not change. Prepare a partial budget on a per acre basis to analyze this alternative. Assume that each acre yields 2.5 tons of alfalfa hay. You must label the entries in the partial budget. The following information shows the potential cost savings per acre if Gerald chooses the new option for cutting, baling, and hauling alfalfa hay. **Note: Write "none" or "zero" in any category with no entry. Round answers to two decimal places.**

Operation	Potential Cost Savings Per Acre
Swathing	$40.32
Baling	$39.64
Hauling	$20.85

Total hours of labor saved are 6.5 hours while labor cost is $7.50 per hour.

Complete the partial budget form:
Proposed Change:
To get hay custom cut, baled, and hauled

Added Returns:		Reduced Returns:	
Subtotal	$ **none** (3)	Subtotal	$ **none** (3)
Reduced Costs: **Swathing $ 40.32** **Baling 39.64** **Hauling 20.85** **Labor 48.75**		Added Costs: **$62 * 2.5 $ 155.00**	
		Subtotal	$ **155.00** (3)
Subtotal	$ **149.56** (3)		
Total AR + RC	$ **149.56** (3)	Total RR + AC	$ **155.00** (3)
	Net Change $ **(5.44)** (3)		

Should the change be implemented? Circle the correct response. (4 points)

Yes   (**No**)

End of Problem Solving Section of 2006 FBM CDE