



2012

**North Carolina FFA Farm Business Management
Career Development Event**

Section II: Problem Solving (200 points) KEY

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 seven (7) problems. Check to see that you have 27 pages including the cover page. The point value for each of your answers is stated in parenthesis to the right of each blank or in the question text. You have 100 minutes to complete this section of the Career Development Event.

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2012 NC FFA Farm Business Management

Resource Information

Table 1. Statements of Net Worth

Resource Information for the Brouwer farm business, As of 12/31/2010 and 12/31/2011
2012 NC FFA Farm Business Management Career Development Event

	<u>12/31/10</u>	<u>12/31/11</u>
Assets		
<u>Current Assets</u>		
Cash in Farm Account	\$3,960	\$3,420
Farm Accounts Receivable	0	0
Stored Crops	3,500	8,800
Growing Crops	29,700	37,350
Other Current Assets	0	0
Total Current Assets	37,160	49,570
<u>Non Current Assets</u>		
Machinery & Buildings	140,911	139,386
Land (137 Acres)	335,650	342,500
Total Non-Current Assets	476,561	481,886
Total Farm Assets	\$513,721	\$531,456
Liabilities		
<u>Current Liabilities</u>		
Short Term Notes Payable	\$38,562	\$14,694
Accounts Payable	21,713	12,457
Portion of Machinery and Equipment Debt Due	13,500	13,275
Portion of Land Debt Due	48,600	43,740
Accrued Liabilities (taxes, rent)	0	2,000
Accrued Interest	1,200	0
Total Current Liabilities	123,575	86,166
<u>Non-Current Liabilities</u>		
Non-Current Liabilities Due after one year	296,000	247,400
Land Payment Due after One Year	39,846	37,656
Total Non-Current Liabilities	\$335,846	\$285,056
Total Farm Liabilities	\$459,421	\$371,222
Net Worth (Equity)	\$54,300	\$160,234

Table 2. Income Statements

Resource Information for the Brouwer farm business
2012 NC FFA Farm Business Management Career Development Event

	2010	2011
Revenue		
Leafy Greens	\$164,010	\$170,940
Onions & Garlic	202,350	210,900
Tomatoes	143,000	100,100
Melons	64,800	67,838
Strawberries	99,000	111,375
Farm Service Agency Payments	526	345
Total Revenue	\$673,686	\$661,498
Expenses		
Cash Operating Expenses		
Chemicals	\$114,134	\$129,683
Fertilizer & Lime	41,277	47,754
Freight/Trucking	5,488	5,568
Gas,Fuel,Oil	18,553	19,443
Insurance	98,003	78,336
Crop Insurance	9,083	9,026
Labor Hired	77,398	75,042
Machine Hire	3,004	2,907
Repairs-Mach	7,699	38,576
Repairs-Bldg	18,500	2,514
Seeds/Plants	48,917	52,396
Storage	8,863	7,046
Supplies	9,914	7,527
Taxes	30,798	30,699
Utilities-Farm Share	6,052	8,009
Miscellaneous Farm Expenses	10,742	10,026
Total Cash Operating Expenses	\$508,425	\$524,552
Inventory Adjustments		
Accounts Payable	14,656	-7,875
Change in Accrued Taxes	3,150	2,250
Other Accrued Expenses	1,125	1,350
Depreciation	13,320	12,150
Total Operating Expenses	\$580,093	\$542,052
Cash Interest Paid	14,812	26,082
Change in Interest Payable	0	0
Total Interest Expense	\$14,812	\$26,082
Total Expenses	\$594,905	\$568,134
Net Farm Income From Operations	\$7,281	\$43,314

Table 3. Onions & Garlic, owned, harvest & market

Resource Information for the Brouwer farm business, 31-Jan-12
 2012 NC FFA Farm Business Management Career Development Event

OPERATING INPUTS	UNITS	PRICE	QUANTITY	VALUE
Bulbs	Per Acre	300.000	1	300.00
Fumigation	Gallons	11.950	10.5	125.48
Organic Fertilizer (8-8-24)	Tons	800.000	1	800.00
Organic Sodium Nitrate (16-0-0)	Cwt	18.200	1.76	32.03
Organic Lime	Tons	27.000	9	243.00
Organic Herbicide & Fungicide	Per Acre	150.000	3	450.00
Organic Insecticides	Per Acre	47.160	1	47.16
Weed and Pest Management	Hours	60.510	15	907.65
Compost	Per Acre	151.000	1	151.00
Fuel, Lube and Repairs	Per Acre	450.000	1	450.00
Electricity	Kilowatt Hour	90.000	0.780	70.20
Crop Insurance	Dollars	75.000	1.000	75.00
Building Insurance	Dollars	83.200	1.000	83.20
Selling Charges	Dollars	1.000	1,200.000	1,200.00
Harvest Costs	Dollars	1.000	8,375.000	8,375.00
Baling Supplies	Dollars	8.000	1.000	8.00
Tractor/Machinery	Per Acre	66.210	1.000	66.21
Labor	Hours	9.500	75.000	712.50
Interest on Operating Capital	Dollars	6.00%	641.010	38.46
TOTAL OPERATING COSTS				14,134.89
FIXED COSTS		AMOUNT	VALUE	
Machinery/Tractor				
Interest at 7.150%		1.00	105.91	
Depr, Taxes, Insurance				
Barns				
Interest at 7.150%		1.00	132.58	
Depr, Taxes, Insurance		0.00	0.00	
Equipment				
Interest at 7.150%		0.00	0.00	
Depr, Taxes, Insurance		0.00	0.00	
Land				
Interest at 7.150%		0.00	0.00	
Taxes		0.00	0.00	
TOTAL FIXED COSTS				238.49
PRODUCTION	UNITS	PRICE	QUANTITY	VALUE
Onions & Garlic	Per Pounds	1.60	9,500.00	15,200.00
Net Govt Payment	Per Acre	0.00	0.00	0.00
TOTAL RECEIPTS				15,200.00
TOTAL RECEIPTS				15,200.00
TOTAL OPERATING COSTS				14,134.89
RETURNS ABOVE TOTAL OPERATING COSTS				1,065.11
TOTAL FIXED COSTS				238.49
NET RETURNS ABOVE ALL SPECIFIED COSTS				826.62

Table 4. Leafy Greens, owned, harvest and market

Resource Information for the Brouwer farm business, 31-Jan-12
2012 NC FFA Farm Business Management Career Development Event

OPERATING INPUTS	UNITS	PRICE	QUANTITY	VALUE
Transplants	Per Acre	88.000	1	88.00
Fumigation	Gallons	11.950	10.5	125.48
Organic Fertilizer (8-8-24)	Tons	350.000	1	350.00
Organic Sodium Nitrate (16-0-0)	Cwt	18.200	1.76	32.03
Organic Lime	Tons	27.000	0.33	8.91
Organic Herbicide & Fungicide	Per Acre	67.820	1	67.82
Organic Insecticides	Per Acre	47.160	1	47.16
Weed and Pest Management	Hours	60.510	9.5	574.85
Compost	Per Acre	151.000	1	151.00
Fuel, Lube and Repairs	Per Acre	762.000	1	762.00
Electricity	Kilowatt Hour	90.000	0.780	70.20
Crop Insurance	Dollars	200.000	1.000	200.00
Building Insurance	Dollars	83.200	1.000	83.20
Selling Charges	Dollars	0.000	2,350.000	0.00
Harvest Costs	Dollars	1.000	4,838.000	4,838.00
Baling Supplies	Dollars	8.000	1.000	8.00
Tractor/Machinery	Per Acre	66.210	1.000	66.21
Labor	Hours	9.500	216.000	2,052.00
Interest on Operating Capital	Dollars	6.00%	641.010	38.46
TOTAL OPERATING COSTS				9,563.31
FIXED COSTS		AMOUNT	VALUE	
Machinery/Tractor				
Interest at 7.150%		1.00	105.91	
Depr, Taxes, Insurance				
Barns				
Interest at 7.150%		1.00	132.58	
Depr, Taxes, Insurance		0.00	0.00	
Equipment				
Interest at 7.150%		0.00	0.00	
Depr, Taxes, Insurance		0.00	0.00	
Land				
Interest at 7.150%		0.00	0.00	
Taxes		0.00	0.00	
TOTAL FIXED COSTS				238.49
PRODUCTION	UNITS	PRICE	QUANTITY	VALUE
Leaf Lettuce	Per Box	14.00	750.00	10,500.00
Net Govt Payment	Per Acre	0.00	0.00	0.00
TOTAL RECEIPTS				10,500.00
TOTAL RECEIPTS				10,500.00
TOTAL OPERATING COSTS				9,563.31
RETURNS ABOVE TOTAL OPERATING COSTS				936.69
TOTAL FIXED COSTS				238.49
NET RETURNS ABOVE ALL SPECIFIED COSTS				698.20

Table 5. Future Value (FV) of \$1 Investment

n/I	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	7.0%	8.0%
1	1.01000	1.01500	1.02000	1.02500	1.03000	1.03500	1.04000	1.04500	1.05000	1.05500	1.06000	1.07000	1.08000
2	1.02010	1.03022	1.04040	1.05063	1.06090	1.07123	1.08160	1.09203	1.10250	1.11303	1.12360	1.14490	1.16640
3	1.03030	1.04568	1.06121	1.07689	1.09273	1.10872	1.12486	1.14117	1.15763	1.17424	1.19102	1.22504	1.25971
4	1.04060	1.06136	1.08243	1.10381	1.12551	1.14752	1.16986	1.19252	1.21551	1.23882	1.26248	1.31080	1.36049
5	1.05101	1.07728	1.10408	1.13141	1.15927	1.18769	1.21665	1.24618	1.27628	1.30696	1.33823	1.40255	1.46933
6	1.06152	1.09344	1.12616	1.15969	1.19405	1.22926	1.26532	1.30226	1.34010	1.37884	1.41852	1.50073	1.58687
7	1.07214	1.10984	1.14869	1.18869	1.22987	1.27228	1.31593	1.36086	1.40710	1.45468	1.50363	1.60578	1.71382
8	1.08286	1.12649	1.17166	1.21840	1.26677	1.31681	1.36857	1.42210	1.47746	1.53469	1.59385	1.71819	1.85093
9	1.09369	1.14339	1.19509	1.24886	1.30477	1.36290	1.42331	1.48610	1.55133	1.61909	1.68948	1.83846	1.99900
10	1.10462	1.16054	1.21899	1.28008	1.34392	1.41060	1.48024	1.55297	1.62889	1.70814	1.79085	1.96715	2.15892
11	1.11567	1.17795	1.24337	1.31209	1.38423	1.45997	1.53945	1.62285	1.71034	1.80209	1.89830	2.10485	2.33164
12	1.12683	1.19562	1.26824	1.34489	1.42576	1.51107	1.60103	1.69588	1.79586	1.90121	2.01220	2.25219	2.51817
13	1.13809	1.21355	1.29361	1.37851	1.46853	1.56396	1.66507	1.77220	1.88565	2.00577	2.13293	2.40985	2.71962
14	1.14947	1.23176	1.31948	1.41297	1.51259	1.61869	1.73168	1.85194	1.97993	2.11609	2.26090	2.57853	2.93719
15	1.16097	1.25023	1.34587	1.44830	1.55797	1.67535	1.80094	1.93528	2.07893	2.23248	2.39656	2.75903	3.17217
16	1.17258	1.26899	1.37279	1.48451	1.60471	1.73399	1.87298	2.02237	2.18287	2.35526	2.54035	2.95216	3.42594
17	1.18430	1.28802	1.40024	1.52162	1.65285	1.79468	1.94790	2.11338	2.29202	2.48480	2.69277	3.15882	3.70002
18	1.19615	1.30734	1.42825	1.55966	1.70243	1.85749	2.02582	2.20848	2.40662	2.62147	2.85434	3.37993	3.99602
19	1.20811	1.32695	1.45681	1.59865	1.75351	1.92250	2.10685	2.30786	2.52695	2.76565	3.02560	3.61653	4.31570
20	1.22019	1.34686	1.48595	1.63862	1.80611	1.98979	2.19112	2.41171	2.65330	2.91776	3.20714	3.86968	4.66096
21	1.23239	1.36706	1.51567	1.67958	1.86029	2.05943	2.27877	2.52024	2.78596	3.07823	3.39956	4.14056	5.03383
25	1.28243	1.45095	1.64061	1.85394	2.09378	2.36324	2.66584	3.00543	3.38635	3.81339	4.29187	5.42743	6.84848
30	1.34785	1.56308	1.81136	2.09757	2.42726	2.80679	3.24340	3.74532	4.32194	4.98395	5.74349	7.61226	10.06266
40	1.48886	1.81402	2.20804	2.68506	3.26204	3.95926	4.80102	5.81636	7.03999	8.51331	10.28572	14.97446	21.72452

Table 6. Future Value (FV) of \$1 Annuity

n/i	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	7.0%	8.0%
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	2.0100	2.0150	2.0200	2.0250	2.0300	2.0350	2.0400	2.0450	2.0500	2.0550	2.0600	2.0700	2.0800
3	3.0301	3.0452	3.0604	3.0756	3.0909	3.1062	3.1216	3.1370	3.1525	3.1680	3.1836	3.2149	3.2464
4	4.0604	4.0909	4.1216	4.1525	4.1836	4.2149	4.2465	4.2782	4.3101	4.3423	4.3746	4.4399	4.5061
5	5.1010	5.1523	5.2040	5.2563	5.3091	5.3625	5.4163	5.4707	5.5256	5.5811	5.6371	5.7507	5.8666
6	6.1520	6.2296	6.3081	6.3877	6.4684	6.5502	6.6330	6.7169	6.8019	6.8881	6.9753	7.1533	7.3359
7	7.2135	7.3230	7.4343	7.5474	7.6625	7.7794	7.8983	8.0192	8.1420	8.2669	8.3938	8.6540	8.9228
8	8.2857	8.4328	8.5830	8.7361	8.8923	9.0517	9.2142	9.3800	9.5491	9.7216	9.8975	10.2598	10.6366
9	9.3685	9.5593	9.7546	9.9545	10.1591	10.3685	10.5828	10.8021	11.0266	11.2563	11.4913	11.9780	12.4876
10	10.4622	10.7027	10.9497	11.2034	11.4639	11.7314	12.0061	12.2882	12.5779	12.8754	13.1808	13.8164	14.4866
11	11.5668	11.8633	12.1687	12.4835	12.8078	13.1420	13.4864	13.8412	14.2068	14.5835	14.9716	15.7836	16.6455
12	12.6825	13.0412	13.4121	13.7956	14.1920	14.6020	15.0258	15.4640	15.9171	16.3856	16.8699	17.8885	18.9771
13	13.8093	14.2368	14.6803	15.1404	15.6178	16.1130	16.6268	17.1599	17.7130	18.2868	18.8821	20.1406	21.4953
14	14.9474	15.4504	15.9739	16.5190	17.0863	17.6770	18.2919	18.9321	19.5986	20.2926	21.0151	22.5505	24.2149
15	16.0969	16.6821	17.2934	17.9319	18.5989	19.2957	20.0236	20.7841	21.5786	22.4087	23.2760	25.1290	27.1521
16	17.2579	17.9324	18.6393	19.3802	20.1569	20.9710	21.8245	22.7193	23.6575	24.6411	25.6725	27.8881	30.3243
17	18.4304	19.2014	20.0121	20.8647	21.7616	22.7050	23.6975	24.7417	25.8404	26.9964	28.2129	30.8402	33.7502
18	19.6147	20.4894	21.4123	22.3863	23.4144	24.4997	25.6454	26.8551	28.1324	29.4812	30.9057	33.9990	37.4502
19	20.8109	21.7967	22.8406	23.9460	25.1169	26.3572	27.6712	29.0636	30.5390	32.1027	33.7600	37.3790	41.4463
20	22.0190	23.1237	24.2974	25.5447	26.8704	28.2797	29.7781	31.3714	33.0660	34.8683	36.7856	40.9955	45.7620
21	23.2392	24.4705	25.7833	27.1833	28.6765	30.2695	31.9692	33.7831	35.7193	37.7861	39.9927	44.8652	50.4229
30	34.7849	37.5387	40.5681	43.9027	47.5754	51.6227	56.0849	61.0071	66.4388	72.4355	79.0582	94.4608	113.2832
40	48.8864	54.2679	60.4020	67.4026	75.4013	84.5503	95.0255	107.0303	120.7998	136.6056	154.7620	199.6351	259.0565

Table 7. Present Value (PV) of \$1 Lump Sum

n/i	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	7.0%	8.0%
1	0.99010	0.98522	0.98039	0.97561	0.97087	0.96618	0.96154	0.95694	0.95238	0.94787	0.94340	0.93458	0.92593
2	0.98030	0.97066	0.96117	0.95181	0.94260	0.93351	0.92456	0.91573	0.90703	0.89845	0.89000	0.87344	0.85734
3	0.97059	0.95632	0.94232	0.92860	0.91514	0.90194	0.88900	0.87630	0.86384	0.85161	0.83962	0.81630	0.79383
4	0.96098	0.94218	0.92385	0.90595	0.88849	0.87144	0.85480	0.83856	0.82270	0.80722	0.79209	0.76290	0.73503
5	0.95147	0.92826	0.90573	0.88385	0.86261	0.84197	0.82193	0.80245	0.78353	0.76513	0.74726	0.71299	0.68058
6	0.94205	0.91454	0.88797	0.86230	0.83748	0.81350	0.79031	0.76790	0.74622	0.72525	0.70496	0.66634	0.63017
7	0.93272	0.90103	0.87056	0.84127	0.81309	0.78599	0.75992	0.73483	0.71068	0.68744	0.66506	0.62275	0.58349
8	0.92348	0.88771	0.85349	0.82075	0.78941	0.75941	0.73069	0.70319	0.67684	0.65160	0.62741	0.58201	0.54027
9	0.91434	0.87459	0.83676	0.80073	0.76642	0.73373	0.70259	0.67290	0.64461	0.61763	0.59190	0.54393	0.50025
10	0.90529	0.86167	0.82035	0.78120	0.74409	0.70892	0.67556	0.64393	0.61391	0.58543	0.55839	0.50835	0.46319
11	0.89632	0.84893	0.80426	0.76214	0.72242	0.68495	0.64958	0.61620	0.58468	0.55491	0.52679	0.47509	0.42888
12	0.88745	0.83639	0.78849	0.74356	0.70138	0.66178	0.62460	0.58966	0.55684	0.52598	0.49697	0.44401	0.39711
13	0.87866	0.82403	0.77303	0.72542	0.68095	0.63940	0.60057	0.56427	0.53032	0.49856	0.46884	0.41496	0.36770
14	0.86996	0.81185	0.75788	0.70773	0.66112	0.61778	0.57748	0.53997	0.50507	0.47257	0.44230	0.38782	0.34046
15	0.86135	0.79985	0.74301	0.69047	0.64186	0.59689	0.55526	0.51672	0.48102	0.44793	0.41727	0.36245	0.31524
16	0.85282	0.78803	0.72845	0.67362	0.62317	0.57671	0.53391	0.49447	0.45811	0.42458	0.39365	0.33873	0.29189
17	0.84438	0.77639	0.71416	0.65720	0.60502	0.55720	0.51337	0.47318	0.43630	0.40245	0.37136	0.31657	0.27027
18	0.83602	0.76491	0.70016	0.64117	0.58739	0.53836	0.49363	0.45280	0.41552	0.38147	0.35034	0.29586	0.25025
19	0.82774	0.75361	0.68643	0.62553	0.57029	0.52016	0.47464	0.43330	0.39573	0.36158	0.33051	0.27651	0.23171
20	0.81954	0.74247	0.67297	0.61027	0.55368	0.50257	0.45639	0.41464	0.37689	0.34273	0.31180	0.25842	0.21455
21	0.81143	0.73150	0.65978	0.59539	0.53755	0.48557	0.43883	0.39679	0.35894	0.32486	0.29416	0.24151	0.19866
24	0.78757	0.69954	0.62172	0.55288	0.49193	0.43796	0.39012	0.34770	0.31007	0.27666	0.24698	0.19715	0.15770
25	0.77977	0.68921	0.60953	0.53939	0.47761	0.42315	0.37512	0.33273	0.29530	0.26223	0.23300	0.18425	0.14602
28	0.75684	0.65910	0.57437	0.50088	0.43708	0.38165	0.33348	0.29157	0.25509	0.22332	0.19563	0.15040	0.11591
29	0.74934	0.64936	0.56311	0.48866	0.42435	0.36875	0.32065	0.27902	0.24295	0.21168	0.18456	0.14056	0.10733
30	0.74192	0.63976	0.55207	0.47674	0.41199	0.35628	0.30832	0.26700	0.23138	0.20064	0.17411	0.13137	0.09938
31	0.73458	0.63031	0.54125	0.46511	0.39999	0.34423	0.29646	0.25550	0.22036	0.19018	0.16425	0.12277	0.09202
40	0.67165	0.55126	0.45289	0.37243	0.30656	0.25257	0.20829	0.17193	0.14205	0.11746	0.09722	0.06678	0.04603

Table 8. Present Value (PV) of \$1 Annuity

n/i	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	7.0%	8.0%
1	0.99010	0.98522	0.98039	0.97561	0.97087	0.96618	0.96154	0.95694	0.95238	0.94787	0.94340	0.93458	0.92593
2	1.97040	1.95588	1.94156	1.92742	1.91347	1.89969	1.88609	1.87267	1.85941	1.84632	1.83339	1.80802	1.78326
3	2.94099	2.91220	2.88388	2.85602	2.82861	2.80164	2.77509	2.74896	2.72325	2.69793	2.67301	2.62432	2.57710
4	3.90197	3.85438	3.80773	3.76197	3.71710	3.67308	3.62990	3.58753	3.54595	3.50515	3.46511	3.38721	3.31213
5	4.85343	4.78264	4.71346	4.64583	4.57971	4.51505	4.45182	4.38998	4.32948	4.27028	4.21236	4.10020	3.99271
6	5.79548	5.69719	5.60143	5.50813	5.41719	5.32855	5.24214	5.15787	5.07569	4.99553	4.91732	4.76654	4.62288
7	6.72819	6.59821	6.47199	6.34939	6.23028	6.11454	6.00205	5.89270	5.78637	5.68297	5.58238	5.38929	5.20637
8	7.65168	7.48593	7.32548	7.17014	7.01969	6.87396	6.73274	6.59589	6.46321	6.33457	6.20979	5.97130	5.74664
9	8.56602	8.36052	8.16224	7.97087	7.78611	7.60769	7.43533	7.26879	7.10782	6.95220	6.80169	6.51523	6.24689
10	9.47130	9.22218	8.98259	8.75206	8.53020	8.31661	8.11090	7.91272	7.72173	7.53763	7.36009	7.02358	6.71008
11	10.36763	10.07112	9.78685	9.51421	9.25262	9.00155	8.76048	8.52892	8.30641	8.09254	7.88687	7.49867	7.13896
12	11.25508	10.90751	10.57534	10.25776	9.95400	9.66333	9.38507	9.11858	8.86325	8.61852	8.38384	7.94269	7.53608
13	12.13374	11.73153	11.34837	10.98319	10.63496	10.30274	9.98565	9.68285	9.39357	9.11708	8.85268	8.35765	7.90378
14	13.00370	12.54338	12.10625	11.69091	11.29607	10.92052	10.56312	10.22283	9.89864	9.58965	9.29498	8.74547	8.24424
15	13.86505	13.34323	12.84926	12.38138	11.93794	11.51741	11.11839	10.73955	10.37966	10.03758	9.71225	9.10791	8.55948
16	14.71787	14.13126	13.57771	13.05500	12.56110	12.09412	11.65230	11.23402	10.83777	10.46216	10.10590	9.44665	8.85137
17	15.56225	14.90765	14.29187	13.71220	13.16612	12.65132	12.16567	11.70719	11.27407	10.86461	10.47726	9.76322	9.12164
18	16.39827	15.67256	14.99203	14.35336	13.75351	13.18968	12.65930	12.15999	11.68959	11.24607	10.82760	10.05909	9.37189
19	17.22601	16.42617	15.67846	14.97889	14.32380	13.70984	13.13394	12.59329	12.08532	11.60765	11.15812	10.33560	9.60360
20	18.04555	17.16864	16.35143	15.58916	14.87747	14.21240	13.59033	13.00794	12.46221	11.95038	11.46992	10.59401	9.81815
21	18.85698	17.90014	17.01121	16.18455	15.41502	14.69797	14.02916	13.40472	12.82115	12.27524	11.76408	10.83553	10.01680
25	22.02316	20.71961	19.52346	18.42438	17.41315	16.48151	15.62208	14.82821	14.09394	13.41393	12.78336	11.65358	10.67478
30	25.80771	24.01584	22.39646	20.93029	19.60044	18.39205	17.29203	16.28889	15.37245	14.53375	13.76483	12.40904	11.25778
40	32.83469	29.91585	27.35548	25.10278	23.11477	21.35507	19.79277	18.40158	17.15909	16.04612	15.04630	13.33171	11.92461

2012 NC FFA Farm Business Management

Problem Solving Section

Part 1 – Analysis of Cash Flow

27 points

Because cash revenue from farm operations varies widely from month-to-month, Mrs. Brouwer wants to assess her cash situation by quarter. In this section, complete the information about the Brouwer Farm Business cash flow based on the information given below. **Round to the nearest dollar.** Each question is worth 3 points

Important note: The Brouwers must maintain a minimum cash balance of \$3,000.

Quarter	1 st	2 nd	3 rd	4 th
Projected Cash Inflows	425,600	125,400	130,300	437,800
Projected Cash Outflows	370,500	230,700	120,900	275,600
Family Living	18,000	18,000	18,000	18,000
Cash difference	37,100	(123,300)	(8,600)	144,200
Beginning cash balance	28,900	66,000	3,000	3,000
Cash position	66,000	(57,300)	(5,600)	147,200
Money Borrowed this Period	0	60,300	8,600	0
Payment on Loan	0	0	0	68,900
Ending cash balance (before interest payment)	66,000	3,000	(59,100)	78,300

What is the **cash difference** in the 1st quarter? 37,100

What is the **cash position** in the 1st quarter? 66,000

Which quarter has the **largest cash inflow**? fourth

Which quarter has the **smallest cash inflow**? second

What is the **total inflow**? 1,119,100

How much do they need to borrow each quarter to maintain the listed ending balance?

1st Quarter 0

2nd Quarter 60,300

3rd Quarter 8,600

4th Quarter 0

Part 2 – Analysis of Balance Sheets

44 points

Questions 1 through 11 refer to Brouwer Farm Business **Table 1. Statements of Net Worth** on **page 4**. For multiple choice questions, circle the correct response. For all other questions, write your answer in the blank. **Round ratios to two decimals.** Each question is worth 4 points.

1. What was Brouwer Farm Business' Current Ratio on **December 31, 2010**?

0.301 or 0.30 (37160 / 123575)

2. What was Brouwer Farm Business' Current Ratio on **December 31, 2011**?

0.575 or 0.58 (49570 / 86166)

3. How much working capital did the Brouwer Farm Business have on **December 31, 2011**?

-36,596 (49570 - 86166)

4. Which measure shows the size or magnitude of the ratio of total liabilities to total assets?

- a) Equity-to-asset ratio
- b) Net worth
- c) **Debt-to-asset ratio ****
- d) All of the above
- e) None of the above

5. Consider the change in **liquidity** on Brouwer Farm Business between December 31, 2010 and December 31, 2011. Based on the balance sheet information, was the farm business:

- a) More liquid on December 31, 2010
- b) **More liquid on December 31, 2011 ****
- c) Less liquid on December 31, 2011
- d) Both B and C
- e) None of the above

6. What was the Brouwer Farm Business **Debt-to-Equity Ratio** on **December 31, 2010**?

8.46 (459421 / 54300)

7. What percent of the Brouwer Farm Business **assets were financed by debt** on **December 31, 2010**?

89% or 89.4 (459421 / 513721 *100%)

8. Consider the change in solvency on Brouwer Farm Business between December 31, 2010 and December 31, 2011. Based on the balance sheet information, was the farm business:

- a) More solvent on December 31, 2010
- b) **More solvent on December 31, 2011 ****
- c) Less solvent on December 31, 2011
- d) Both A and C
- e) None of the above

9. What was Brouwer Farm Business **Equity-to-Asset Ratio** on **December 31, 2011**?

0.30 or 0.301 (160234 / 531456)

10. What percent of Brouwer Farm Business **assets were financed by equity** on **December 31, 2011**?

30% (160234 / 531456)*100%

11. Assume the liability values are accurate and the asset values shown on the balance sheet accurately represent the values of the assets if the assets had been sold on the dates specified. If on **December 31, 2011**, Brouwer Farm Business had **sold all assets** and **paid off all debts**, how much money would the business have had left?

160,234 (define: equity)

Part 3 – Analysis of Income Statements

20 points

Questions 1 through 6 refer to Brouwer Farm Business **Table 1. Statements of Net Worth on page 4** and **Table 2. Income Statements on page 5**. Round your answers to two decimals. Each question is worth 4 points.

Important Notes:

- **Opportunity Cost of Farm Equity is 6.5%**
- **Value of Unpaid Labor is \$35,000**

1. What is the **rate of return on assets in 2011**?

6.58 %

$$(\text{NFI} + \text{Interest} - \text{Unpaid Labor}) / [(\text{Average Value of Assets})] = (43314 + 26082 - 35000) / \{(513721 + 531456)/2\} * 100\% = 6.58\%$$

2. What is the **rate of return on equity in 2011**?

7.75 %

$$(\text{NFI} - \text{Unpaid Labor}) / [(\text{Average Value of Equity})] = (43314 - 35000) / \{(54300 + 160234)/2\} * 100\% = 7.75\%$$

3. What is the **asset turnover ratio in 2011**?

1.26 OR 126% OR 1.27 OR 127%

$$(\text{Gross Revenue}) / [(\text{Average Value of Assets})] = (661498) / \{(513721 + 531456)/2\} = 1.17$$

*NOTE: The 2011 exam incorrectly listed this as a percent. Either answer is fine; however, respondent needs to be cautious about including “%” sign if they are providing the number in terms of a percent.

4. What is the **return to management in 2011**?

\$ 1341.65 or 1342 or 1341.64

$$(\text{NFI} - \text{Unpaid labor} - \text{opportunity cost of farm equity}) = 43314 - 35000 - 0.065 * \{(54300 + 160234)/2\} = 1341.64$$

5. What is the **net farm income from operations ratio in 2011**?

0.065 or 6.5% or 6.55%

$$(\text{NFI} / \text{Gross revenue}) = 43314 / 661498$$

*NOTE: The 2011 exam incorrectly listed this as a percent. Either answer is fine; however, respondent needs to be cautious about including “%” sign if they are providing the number in terms of a percent.

Part 4 – Enterprise & Budget Management

37 points

This part of the exam contains **three sections**.

- A. Properly identifying variable and fixed costs is important in planning and developing enterprise budgets. For the following costs, identify whether each item is a variable cost or a fixed cost. **Write a “V” in the blank if the item is a variable cost. Write an “F” in the blank if the item is a fixed cost. (1 point for each blank)**

- F Depreciation on machinery
- V Hourly labor
- F Insurance for machinery and equipment
- F Salary labor
- V Custom harvesting expenses
- V Feed purchases
- F Real estate taxes
- F or V Interest on annual operating capital
- V Fertilizer purchases

Interest of annual operating capital is a variable expense at the beginning of a production cycle. However, the variability of this expense (and all expenses, for that matter) decreases as the product moves closer to completion. A better way of wording this question would be to inform the participant of the stage of the production cycle.

For instance, which costs are fixed just before harvest? Answer: All costs except the labor materials needed for harvesting. The crops are in the ground. The producer is still on the hook for all costs up to that point of production, regardless of how much she chooses to harvest.

Which costs are fixed at the beginning of farm planning? Nearly all of them (perhaps except for land, unless the land hasn't yet been purchased or rented).

Participants should think about fixed and variable costs in the context of the stage of production. It'll make conceptualizing enterprise and partial budgets much more straight forward.

B. Match the terms on the right with their correct descriptions. Write the correct numbers in the blanks provided. (1 point each)

6	Costs incurred by the farm that do not vary	1. Break-even level of production.
5	Shows the projected costs and returns associated with one production process usually for one production period.	2. Budget
8	Invest money where it will earn the highest returns. If you have limited resources, use each unit of a resource where it will give the greatest returns	3. Cost of Production
7	Shows projected costs and returns associated with some change in the farm or ranch business.	4. Enterprise
2	A schedule of expected returns and costs	5. Enterprise Budget
9	Costs which change directly with the level of production. (Also called operating costs)	6. Fixed Costs
1	The output required for revenue to equal the total of fixed and variable costs	7. Partial Budget
3	Costs of the fixed and variable inputs needed to obtain output.	8. Principle of Equi-Marginal Return
4	A specific process or activity producing a single output.	9. Variable Costs
10	Shows the physical and financial plan for the entire farm or ranch business for a specific period of time. It is the total of all production processes.	10. Whole Farm Budget

C. **Review Table 3. enterprise budget on page 6.** Answer the following questions related to Mrs. Brouwer's projections. **(2 points each correct response)**

1. What is the expected yield per acre?

_____ 9,500 _____ pounds

2. What is the expected price for onions and garlic?

\$ _____ 1.60 _____ per pound

3. What are the expected costs per acre for compost?

\$ _____ 151 _____ per acre

4. What quantity of organic sodium nitrate will be applied per acre?

_____ 1.76 _____ cwt.

5. If the price remains at \$1.60 per head and all costs remain unchanged, what is the break-even yield per acre to cover total operating costs? **Round answer to nearest whole number.**

_____ 8835 _____ pounds
14134.89 / 1.60 = 8834.3 → 8835

6. **True or False:** Mrs. Brouwer should discount for time and risk. In other words, when different alternatives involve different time periods and/or elements or risk, Mrs. Brouwer should base comparisons on discounted values. CIRCLE THE CORRECT RESPONSE

TRUE

FALSE

7. **True or False:** Mrs. Brouwer should invest more if the returns decrease. She should add units of an input as long as the value of the resulting output is less than the added costs of the inputs. CIRCLE THE CORRECT RESPONSE

TRUE

FALSE

Part 5 – Time Value of Money

24 points

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

<p>PV = Present Value FV = Future Value r = interest or discount rate n = number of years</p>	<p>Round decimals to the <i>nearest cent</i> (e.g. \$1234.5678 rounds to \$1234.57 and \$1234.1234 rounds to \$1234.12)</p>
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Use the tables on **pages 8 – 11** or the formula in the box above to calculate the value for questions 1 – 4. Write your answer(s) in the blank(s) provided for each question. Show your calculations (ask the proctor for another sheet if necessary).

1. 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 5 years?

\$ 2233.49 (4 points)

from Table 5 on page 8: $\$1750 \times 1.27628 = \2233.49
 or by formula: $FV = PV * (1 + r)^n = (\$1750) (1.05)^5 = \2233.492734

2. 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 10 years?

\$ 2850.56 or 2850.57 (4 points)

From Table 5 on page 8: $\$1,750 \times 1.62889 = \$2,850.5575$ or by formula: $FV = PV * (1 + r)^n = (\$1,750) (1.05)^{10} = \$2,850.56559$

3. 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 \$ 463.30 (4 points)

+ present value of expected selling price \$ 1534.78 (4 points)

= amount you could afford to pay \$ 1998.09 or 1998.19 (4 points)

from Table 8 on page 11: present value of net cash revenues: $\$60 * 7.72173 = \$ 463.3038$
 from Table 7 on page 10: present value of expected selling price: $\$2500 * 0.61391 = \$1,534.775$
 $\$463.30 + \$1,534.78 = \$1,998.08$ or by the formula: $PV = FV / (1 + r)^n = 60 / (1.05)^1 + 60 / (1.05)^2 + 60 / (1.05)^3 + 60 / (1.05)^4 + 60 / (1.05)^5 + 60 / (1.05)^6 + 60 / (1.05)^7 + 60 / (1.05)^8 + 60 / (1.05)^9 + 60 / (1.05)^{10} + 2500 / (1.05)^{10} = 57.1428 + 54.4217 + 51.8313 + 49.3623 + 47.0145 + 44.7761 + 42.6408 + 40.6118 + 38.6772 + 36.8369 + 1534.8722 = 1998.19$

4. Mrs. Brouwer wishes to have \$50,000 ten years from now as a college fund for her daughter. How much money would have to be invested today at 6% compound interest?

\$ 27,919.50 or 27,919.70 or
27,920.48 or 27,919.74 (4
points)

from Table 7 on page 10: $\$50,000 * 0.55839 =$
 $\$27,919.50$
OR Table 5 on page 8: $\$50,000 / 1.79085 = 27,919.70$
or by the formula: $PV = FV / (1 + r)^n = 50000 / (1.06)^{10} =$
 $50000 / 1.7908 = \$27,920.48$ or
 $50000 / 1.790848 = \$27,919.74$
[difference is due to rounding of calculations, quite a
bit of leeway was given]

Part 6 – Income Tax Management

26 points

Answer the following questions about the Brouwer Farm Business. Unless otherwise noted, use the **straight-line** method of depreciation.

- In 2010, Mrs. Brouwer bought a tractor for \$95,000. For her 2010 taxes, she claimed the full value of the tractor as a Section 179 deduction. For the purposes of her 2011 taxes, what is the adjusted basis of the tractor?

\$ 0 (2)

- Mrs. Brouwer bought a used bobcat for \$17,000. In addition she paid \$750 in sales taxes and a \$550 dealer delivery charge. To finance the purchase she borrowed \$10,000 from her bank, and received a \$5,000 credit for her old trade-in. The balance she paid in cash. What is her basis?

\$ 18300 (5)

- For each of the items listed, place a **L** if it would be used in **low income year** and an **H** if it would be recommended for use in a **high income year** to make the best use of good tax planning for those years. (1 point each)

Item	Your Answer
Collect money due from custom work done	L
Get every expense recorded which you are entitled	H
Increase charitable contributions	H
Borrow money at bank to pay outstanding accounts	H
Use straight line depreciation	L
Delay sales of livestock or crops	H
Buy feed and other supplies for future use	H
Sell capital items which are no longer useful	L
Take option of reporting sealed grain as income	L
Pay wages to family members	H
Buy needed equipment for increased depreciation	H
Depreciate major repairs on buildings	H
Use Section 179 expensing rule	H
Postpone payments on open accounts till next year	L

4. Mr. Brouwer works for a local coffee roaster. He receives a salary and benefits, including medical insurance and free coffee. The income from his off-farm job is subject to which of the following taxes? (4 points. **Must have all three correct answers to earn points**)
- a. Self-employment tax
 - b. Employee's portion of OASDI and Medicare ****
 - c. NC State income tax ****
 - d. Federal income tax ****
 - e. Capital gains tax
 - f. Corporate income tax

Part 7 - Capital Investment Analysis

27 points

1. Based on the 2011 ending balance sheet (refer to **Table 1. Statements of Net Worth**) and the net income from operations in 2011 (refer to **Table 2. Income Statements**), and assuming the Brouwers have **137 acres**, if the Brouwer Farm Business sold their machinery, buildings and land for their balance sheet value and could reinvest at a **10% rate of return**, would they earn **more or less on a per acre basis than they did farming?** 4 points. (Circle the correct response) (4 points)

MORE

LESS

$160,234 * .1 / 137 = 116.95$
 $43314 / 137 = 316.16$

2. The Brouwer Farm Business currently owns and operates a tractor on **120 acres** of farmland. The tractor no longer works and Mrs. Brouwer is deciding between purchasing a new tractor, leasing a tractor from the local machinery dealer and operating it with in-house labor, and hiring the work she needs on a custom basis.

Depreciation Method	To calculate <u>yearly expense</u> :
Straight-line	(Full Purchase Price – Salvage Value) / (Useful life)
150% Declining Balance	(1.5 / useful life) * Adjusted Basis ^a

^a Note: Adjusted Basis = (Full Purchase Price – Cumulative Depreciation). For calculating depreciation in the first year, the Adjusted Basis = Full Purchase Price, since no depreciation has been taken.

Key Assumptions (**Hint: Pay attention to the units.**):

- Mrs. Brouwer assumes the work she needs takes **1.3 hours per acre**, regardless of whether the work is performed in-house or she contracts it out to someone else.
- Mrs. Brouwer’s operating cost for doing the work herself is **\$15 per acre** including labor.
- The full purchase price for a new tractor is **\$65,000**, including all necessary implements. The useful life of the tractor is **7 years** and has a salvage value of **\$2,000**.
- The cost for **leasing** a tractor and all necessary implements averages **\$25 per hour**. This is in addition to the operating cost per acre mentioned previously.
- Hiring the work done on a custom basis would cost **\$25 per hour**.

A. Cost of Owning and Operating the Machinery:

First, calculate the yearly depreciation expense, assuming Mrs. Brouwer uses the **straight-line** method of depreciation. **Show your work. Round to two decimals.**

$$\text{\$ } \underline{\quad 9000 \quad} \quad (2) \quad [(\$65,000 - \$2,000) / 7]$$

Based on your answer above, what is the additional annual fixed cost per acre for owning the tractor? **Show your work. Round to two decimals.**

$$\text{\$ } \underline{\quad 75 \quad} \quad (2) \quad [(\$65,000 - \$2,000) / 7] / 120 = \$75$$

Based on your answer above, what is the **total cost per acre** for owning and operating the tractor? **Show your work. Round to two decimals.**

$$\text{\$ } \underline{\quad 90 \quad} \quad (3) \quad [(\$65,000 - \$2,000) / 7] / 120 + \$15 \text{ per acre} = \$90$$

If Mrs. Brouwer decided to base her decision using **150% declining balance method of depreciation**, what is the **total cost per acre** for owning and operating the tractor in the first year? **Show your work.**

\$ 131.07 (4) $(1.5/7 * \$65,000)/120 + \$15 \text{ per acre} = \$131.07$

B. Cost of Hiring Work on a Custom Basis:

What is the additional fixed cost per acre for custom hiring tractor-related work?

\$ 0 (2) There are no additional fixed costs associated with custom hiring tractor related work.

What is the **total cost per acre** for hiring tractor-related work on a custom basis? **Show your work.**

\$ 32.50 (2) $[\$25 * 1.3]$

C. Cost of Leasing and Operating the Machinery:

First, calculate the yearly leasing expense. **Show your work.**

\$ 3900 (3) $120 \text{ acres} * 1.3 \text{ hours per acre} * (\$25)$

What is the **total cost per acre** for leasing and operating the tractor? **Show your work.**

\$ 47.50 (2) $[1.3 \text{ hours per acre} * (\$25)] + \$15$

D. Investment Analysis:

Which one of the four alternatives has the **lowest cost per acre**?

[check one] (3 points)

Own and operate the tractor (using straight-line depreciation)

Own and operate the tractor (using 150% declining balance depreciation)

Hire the work done on a custom basis

Lease the tractor

End of the 2012 NC FFA Farm Business Management Exam

Score Sheet

Name: _____

Chapter: _____

2012 NC FFA			
Farm Business Management: Problem Solving			
		Possible Points	Contestant's Points
Part 1	Analysis of Cash Flow	27	
Part 2	Analysis of Balance Sheets	44	
Part 3	Analysis of Income Statements	20	
Part 4	Enterprise & Budget Management	33	
Part 5	Time Value of Money	24	
Part 6	Income Tax Management	25	
Part 7	Capital Investment Analysis	27	
		200	