

1) (20 pts. total, 2 pts. each) True or False? Mark your answer.

- a) T \_\_\_ F X Wisconsin's cranberry industry maybe important in the U.S., but production in Canada far exceeds U.S. production.
- b) T \_\_\_ F X Data show that most households managing small farms (<\$250,000 in gross revenue) have done well in recent years, earning high farm income.
- c) T \_\_\_ F X With the new Farm Bill, most of the federal subsidies to farmers now come as commodity support payments (PLC & ARC), not crop insurance.
- d) T \_\_\_ F X Most Wisconsin corn and soybean growers insure their crops using Yield Protection (YP) with a 65%-75% coverage level.
- e) T X F \_\_\_ After correcting for inflation real crop prices for corn, soybean and wheat were much higher in the 1970s than recent high prices.
- f) T \_\_\_ F X Average crop yields and dairy cow productivity have not increased much in recent decades, majorly contributing to recent high prices.
- g) T X F \_\_\_ Based on lecturers in class, many farmers can expect more paperwork and record keeping to address sustainability requirements.
- h) T \_\_\_ F X The Dairy Margin Protection Program is a new crop insurance program protecting farmers from declines in their marginal product of feed.
- i) T X F \_\_\_ Life Cycle Assessments estimate the amount of inputs such as energy and water needed to produce, use and dispose of a specific consumer good.
- j) T X F \_\_\_ To buy SCO (Supplemental Coverage Option) insurance, you must buy traditional crop insurance for the crop and enroll in Price Loss Coverage.

2) (17 pts. total) For the questions below, assume you are a farmer.

2a) (6 pts.) What is required for a farmer to be eligible to enroll for the potential to receive corn Price Loss Coverage (PLC) or County Agricultural Risk Coverage (County ARC) payments?

*Operate land with corn base acres*

Suppose a farmer is eligible—what triggers a corn PLC Payment?

*National marketing year average price less than the \$3.70 Reference Price*

Suppose a farmer is eligible—what triggers a corn County ARC Payment?

*Actual county revenue less than the county revenue guarantee for that county*

**2b) (5 pts.)** If you are a farmer, where do you go to sign up/enroll or buy each of the following?

Action	USDA Farm Service Agency	Crop Insurance Agent
Agriculture Risk Coverage (ARC)	XX	
Area Revenue Protection (ARP)		XX
Revenue Protection (RP)		XX
Supplemental Coverage Option (SCO)		XX
Price Loss Coverage (PLC)	XX	

Mark the boxes to indicate your answers to the following questions.

**2c) (3 pts.)** Suppose you have 20 corn base acres enrolled in County ARC. For each action below, would you Keep or Lose your eligibility for a corn County ARC Payment?

Action	Keep	Lose
Plant all 20 acres in soybeans (a program crop)	XX	
Plant all 20 acres in alfalfa (a non-program crop)	XX	
Convert the whole 20 acres to rural housing		XX

**2d) (3 pts.)** Suppose you have 20 base acres enrolled in PLC. For each action below, would you Keep or Lose your eligibility for a corn PLC Payment? (The corn Reference Price is \$3.70/bu).

Action	Keep	Lose
Plant all 20 acres in corn and sell it for \$4.00/bu	XX	
Plant all 20 acres in corn and sell it for \$3.00/bu	XX	
Plant all 20 acres in potatoes to sell to Kettle Chips		XX

**3) (12 pts. total)** Answer the questions below, assuming you grew 50,000 bushels of corn and bought another 30,000 bushels, all to feed to your dairy cows.

**3a) (3 pts.)** Suppose you want to get a Marketing Assistance Loan (MAL), which of the following options are you eligible for? (Mark ALL options that are possible)

- A\_\_ Get a MAL using all 80,000 bu as collateral
- B\_\_ Get a MAL using only the 30,000 bu of purchased corn as collateral
- C XX Get a MAL using only the 50,000 bu of corn you grew as collateral
- D XX Get a MAL using 40,000 bu of the 50,000 bu you grew as collateral
- E\_\_ None of these options, you are not eligible for a MAL
- F\_\_ All of these options are possible for a MAL

**3b) (3 pts.)** If you are eligible and the corn loan rate is \$1.95, what is the maximum Marketing Assistance Loan could you get?

$$50,000 \text{ bu you grew} \times \$1.95 = \$97,500$$

**3c) (3 pts.)** If you took out the maximum Marketing Assistance Loan for your corn, for which of the following cases would you receive a Loan Deficiency Payment? (Mark **ALL** that are correct)

- A  Pay back the MAL when the posted county price is less than the \$1.95 loan rate
- B  Pay back the MAL when the posted county price is greater than the \$1.95 loan rate
- C  Pay back the MAL on May 1 when the posted county price is \$1.80, but sell the corn on June 1 for \$2.00/bu
- D  Pay back the MAL on May 1 when the posted county price is \$2.00, but sell the corn on June 1 for \$1.80/bu
- E  You would receive a Loan Deficiency Payment under all of these conditions
- F  You would receive a Loan Deficiency Payment under none of these conditions

**3d) (3 pts.)** What is the benefit to farmers for using Marketing Assistance Loans, even if they do not expect to receive Loan Deficiency Payments?

*It's a low interest loan to manage cash flow issues, such as to pay back an operating loan due right after harvest, so you can hold the grain and sell later when prices tend to be higher.*

**4) (10 pts. total)** Suppose a farm has an 90 ac field of corn in one insured unit with an average yield of 170 bu/ac as established by crop insurance rules.

**4a) (4 pts.)** Suppose the farmer buys 70% Yield Protection (YP) crop insurance. What is the per acre yield guarantee? What is the total yield guarantee for the 90 ac unit?

*Per Acre Guarantee:  $170 \text{ bu/ac} \times 70\% = 119 \text{ bu/ac}$*

*Unit Guarantee:  $119 \text{ bu/ac} \times 90 \text{ ac} = 10,710 \text{ bu}$*

**4b) (4 pts.)** Suppose the farmer's actual harvested yield is 110 bu/ac on the unit. How many bushels in total does the farmer harvest from the unit. What is the insurance indemnity, if any, assuming a 100% price election of \$4.00/bu?

*Total harvest:  $90 \text{ ac} \times 110 \text{ bu/ac} = 9,900 \text{ bu}$*

*Loss:  $10,710 \text{ bu} - 9,900 \text{ bu} = 810 \text{ bu}$*

*Indemnity:  $\$4.00/\text{bu} \times 810 \text{ bu} = \$3,240$*

**4c) (2 pts.)** Suppose the farmer actually sells the harvested corn for \$3.50/bu. How much does the crop insurance indemnity change?

**Not at all.**

*The insurance indemnity is based on yield loss relative to the guarantee of 10,710 bu for the unit and is paid at a rate of \$4.00/bu as the original price election, regardless of what the farmer actually sells the corn for.*

**5) (12 pts. total)** Suppose a farm has a 100 ac field of soybeans in one insured unit with an average yield of 40 bu/ac as established by crop insurance rules and a \$10.00/bu Base Price.

**5a) (4 pts.)** Suppose the farm buys 75% Revenue Protection (RP) crop insurance. What is the initial per acre revenue guarantee? What is the initial revenue guarantee for the 100 acre unit?

*Initial per acre revenue guarantee:  $75\% \times \$10.00/\text{bu} \times 40 \text{ bu}/\text{ac} = \underline{\$300/\text{ac}}$*

*Initial unit revenue guarantee:  $\$300/\text{ac} \times 100 \text{ ac} = \underline{\$30,000}$*

For 5b and 5c, the price decreases over the season so that the official harvest price is \$9.00/bu.

**5b) (2 pts.)** What is the final revenue guarantee for the 100 acre unit?

*Final per acre revenue guarantee:  $75\% \times \max\{\$10.00/\text{bu} \text{ and } \$9.00/\text{bu}\} \times 40 \text{ bu}/\text{ac} = \$300/\text{ac}$*

*Final unit revenue guarantee remains unchanged at  $\underline{\$30,000}$*

**5c) (2 pts.)** Suppose the farmer actually harvests 3,000 bushels of soybeans from the unit, what would be the insurance indemnity?

*Actual Revenue =  $3,000 \times \$9.00/\text{bu} = \$27,000$*

*Indemnity =  $\$30,000 - \$27,000 = \underline{\$3,000}$*

For 5d and 5e, the price increases over the season so that the official harvest price is \$11.00/bu.

**5d) (2 pts.)** What is the final revenue guarantee for the 100 acre unit?

*Final per acre revenue guarantee:  $75\% \times \max\{\$10.00/\text{bu} \text{ and } \$11.00/\text{bu}\} \times 40 \text{ bu}/\text{ac} = \$330/\text{ac}$*

*Initial unit revenue guarantee:  $\$330/\text{ac} \times 100 \text{ ac} = \underline{\$33,000}$*

**5e) (2 pts.)** Suppose the farmer actually harvests 3,000 bushels of soybeans from the unit, what would be the insurance indemnity?

*Actual Revenue =  $3,000 \times \$11.00/\text{bu} = \$33,000$*

*Indemnity =  $\$33,000 - \$33,000 = \underline{\$0}$  **NO INDEMNITY***

**6 (10 pts. total)** Answer the following questions about crop insurance.

The federal government subsidizes crop insurance, paying about two-thirds of the “actuarially fair” premium for most farmers, so that, from a farmer’s perspective, the loss ratio is about 3.0 while the program loss ratio is around 1.0.

**6a) (4 pts.)** What is the actuarially fair premium? For context, what is the actuarially fair premium for a policy that pays \$100/ac once every 4 years and \$0/ac the other 3 years?

*The premium that “breaks even:” on average – pays as much in indemnities as receives in premiums on average.*

*For a policy that pays \$100 once every 4 years and zero otherwise, the fair premium is \$25/year.*

**6b) (4 pts.)** Explain what a farmer loss ratio of 3.0 means in terms of expected average returns from buying crop insurance. For context, what does a farmer loss ratio of 3.0 mean in terms of an average indemnity for a policy that costs \$10 per acre?

*A loss ratio of 3.0 means that on average, across farmers and years, farmers will receive \$3.00 in indemnities for every dollar they spend on premiums. Thus if the premium costs \$10/ac, a 3.0 loss ratio means indemnities average about \$30/ac.*

**6c) (2 pts.)** In class, we saw maps of corn and soybean loss ratios by county across the Midwest. Which counties tended to have high loss ratios: counties with high average yields like Dane County or those with low average yields like Ashland County?

*Counties with low average yields like Ashland County tended to have high loss ratios.*

**7a) (2 pts.)** What triggers an indemnity for the Area Yield Protection (AYP) crop insurance?

*If the average county yield announced by USDA-NASS is below the county guarantee the insured farmer chose.*

**7b) (4 pts.)** You insure 200 acres of corn under an Area Revenue Protection (ARP) crop insurance policy in Smith County with a 90% coverage level. The county revenue guarantee is  $90\% \times 160 \text{ bu/ac} \times \$4.00/\text{bu} = \$576/\text{ac}$ . If actual county yield is 135 bu/ac and the harvest price is \$4.10, what would be the total insurance indemnity for your corn acres?

*Final revenue guarantee =  $90\% \times 160 \text{ bu/ac} \times \max(\$4.00, \$4.10) = \$590.40/\text{ac}$*

*Actual county revenue =  $135 \text{ bu/ac} \times \$4.10 = \$553.50/\text{ac}$*

*Indemnity per acre =  $\$590.40 - \$553.50 = \$37.20/\text{ac}$*

*Total Indemnity =  $\$37.20/\text{ac} \times 200 \text{ ac} = \underline{\underline{\$7,440}}$*

7c) (4 pts.) How does each event below affect the corn ARP indemnity?

Event	Not at All	Lose Indemnity
Harvest 170 bu/ac from your corn acres	XX	
You are hit by hail and lose 75% of your yield	XX	
Sell your harvested corn for \$3.50/bu	XX	
Sell your harvested corn for \$4.50/bu	XX	

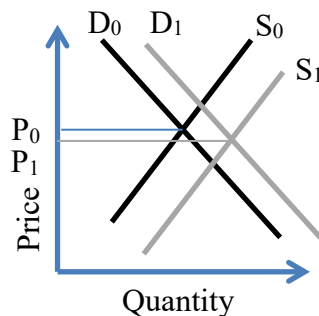
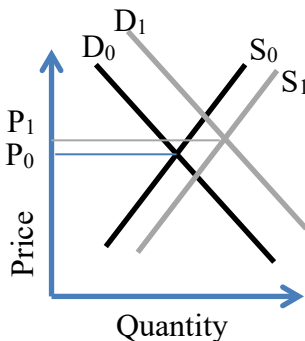
8a) (3 pts.) Sustainability is commonly referred to as having three main elements or aspects. As discussed in class, which of the following name those three elements (Mark all that are correct).

- A XX Social, Economic, and Environmental
- B    Energy, Equity and Environment
- C XX People, Profit and Planet
- D    Personnel, Practices, and Profits
- E    Society, Science, and Satisfaction

8b) (3 pts.) Which of the following statements are consistent with Cochrane's Treadmill as discussed in class (Mark all that are correct).

- A    New technologies increase supply and drive down prices, so smaller farms are more efficient and survive since they have lower overhead.
- B XX Early technology adopters capture the economic benefits of new technologies before prices fall due to higher supplies.
- C    Farmers have to keep adopting new technologies as the old ones become obsolete in order to take advantage of higher prices.
- D XX Farm size will tend to increase as more and more smaller farms become unable to keep up with the technology treadmill and falling real prices.
- E    Data presented in class showed that average U.S. farm size has continued to increase over the last 20-30 years

8c) (3 pts.) Both supply and demand have been increasing. Population and income growth increase demand which increases crop prices while technology change increases supply and reduces crop prices. The plots below show current supply  $S_0$  and demand  $D_0$  for a grain crop, generating the price  $P_0$ . Draw and label a new supply  $S_1$  and new demand  $D_1$  and the new price  $P_1$ . For the left plot, draw the new supply and demand curves to imply a new higher grain price and for the right plot, draw the new supply and demand curves to imply a new lower grain price. Finally, indicate which of the two plots is the outcome predicted by Cochrane's Treadmill.



Cochrane's Treadmill

**9) (4 pts. total)** Answer the following questions about business entities and liability.

**9a) (2 pts.)** Which business entities discussed in class (sole proprietor, partnership, C and S-corporations, limited liability company) provide some limited liability to the owners?

*C and S corporations, LLC, plus limited partnerships for limited partners*

**9b) (2 pts.)** When we say these entities have “limited liability” what is meant – liability for what is limited? Be brief.

*Limited liability means personal assets of owners cannot be used to pay the financial debts of the entity, only the entity’s assets. Their financial liability is limited to the assets they have invested in the entity.*

**10) (16 pts. total)** Provide short answers to each of the following questions. Jon and Amy own a farm, with all assets owned as marital property with a right of survivorship under Wisconsin’s marital property law. They have a daughter Ann. Among their assets is land worth \$600,000 with a tax basis of \$100,000 and \$200,000 of corn grain with a \$0 tax basis (they raised it). Answer each question below. Give a brief explanation for each answer.

**10a) (2 pts.)** If Jon and Amy gave the land and grain to Ann, what is Ann’s income tax basis in the land and in the corn?

*Basis transfers with gift, so land has a \$100,000 basis and grain a \$0 basis.*

**10b) (2 pts.)** If Ann then sells the land for \$600,000 and the corn for \$200,000, how much gain must he report?

*Gain – Selling Price – Basis*

*Land: \$600,000 – \$100,000 = \$500,000*

*Grain: \$200,000 – \$0 = \$200,000*

**10c) (2 pts.)** Considering ordinary income tax, capital gain tax, and self-employment tax, which one or ones of these taxes would Ann owe on this gain from the land sale? Which one or ones of these taxes would Ann owe on this gain from the grain sale?

*Land: owe only capital gains tax*

*Grain: owe ordinary income and self-employment tax*

**10d) (2 pts.)** If Jon died and then Amy gave the land to Ann, how much gain would Ann have to report if she sold the land soon thereafter for \$600,000 and the grain for \$200,000?

*On death of Jon, basis updates to date of death fair market value or \$600,000 and \$200,000.*

*When Amy gives assets to Ann, basis transfer with gift. Gain = selling price minus basis, which would equal zero. **She would report no Gain.***

**10e) (1 pts.)** If Jon did not die, but instead Jon and Amy contributed the land to a Limited Liability Company (LLC) that the two of them completely owned and the next day their LLC sold the land for \$600,000, how much gain would the LLC realize?

*Basis transfers when contribute assets to LLC, so gain = selling price – basis = \$500,000*

**10f) (1 pts.)** Assume the LLC realizes gain from the sale, does it pay income tax on the gain? Do Jon and Amy (sole owners of the LLC) pay income tax on the gain?

*LLC does not pay taxes, but passes income on to owners in proportion to their shares, so Jon and Amy would owe income tax (here only capital gains tax).*

**10g) (1 pts.)** Instead of selling the land, the LLC returns it back to Jon and Amy. Does the LLC and/or Jon and Amy have to pay income tax as a result of this transfer?

*No, removing assets from LLC does not trigger recognition of gain*

**10h) (1 pts.)** Instead Jon and Amy contributed the land to a C-Corporation that the two of them completely owned and the next day their Corporation sold the land for \$600,000, how much gain would the Corporation realize?

*Basis transfers when contribute assets to C Corporation, so gain = selling price – basis = \$500,000*

**10i) (2 pts.)** Assume the Corporation realizes gain from the sale, does it pay income tax on the gain? Do Jon and Amy (sole owners of the Corporation) pay income tax on the gain?

*Yes, C Corporations pay taxes on gains then pass remaining gains to shareholders.  
Yes, shareholders of C Corporations (Jon and Amy) pay taxes on any gains distributed to them.*

**10j) (2 pts.)** Instead of selling the land, the Corporation returns it back to Jon and Amy. Does the Corporation and/or Jon and Amy have to pay income tax as a result of this transfer?

*Transfer of assets out of a C Corporation triggers recognition of gain, so both the C corporation and Jon & Amy pay taxes.*



**11) (6 pts. total)** You are deciding the potassium fertilizer for your soybean crop. This table gives the potassium fertilizer applied in pounds per acre and the soybean yield (bu/ac).

Potassium (lbs/ac)	Yield (bu/ac)	Marginal Product	Value of Marginal Product
30	45.00	--	--
40	46.00	0.1000	\$ 1.00
50	46.50	0.0500	\$ 0.50
60	46.75	0.0250	\$ 0.25

**11a) (2 pts.)** Use this table to show how to calculate the Marginal Product and then fill in the Marginal Product column in the table. Show your work for potential partial credit.

$$MP = \Delta Q / \Delta X = (46 - 45) / (40 - 30) = 1 / 10 = 0.1$$

**11b) (2 pts.)** Soybeans sell for \$10.00/bu. Show how to calculate the Value of Marginal Product for one example, and then fill in the Value of Marginal Product column in the table.

$$VMP = P \times MP = \$10 \times 0.1 = \$1$$

**11c) (2 pts.)** If potassium fertilizer costs \$0.50 per pound, what is the profit maximizing amount to apply based on the table above (you may need to interpolate between entries)?

$$VMP = \text{input price, here} = \$0.50, \text{ which occurs at potassium} = 50 \text{ lbs.}$$

**12) (10 pts)** Soybean yield is  $Y = 30 + 0.9X - 0.01X^2$ , where Y is yield (bu/ac) and X is nitrogen fertilizer (lbs/ac). If the price of soybeans is \$10.00/bu and nitrogen fertilizer costs \$0.50/lb, what is the profit maximizing amount of nitrogen fertilizer to apply? **Don't Forget to Check the Second Order Condition.**

$$\text{Set up profit: } \pi = p * f(x) - r * x = 10(30 + 0.9X - 0.01X^2) - 0.5X$$

$$\text{FOC } d\pi/dX = 10(0.9 - 0.02X) - 0.5 = 0$$

$$\text{Solve FOC for X: } 9 - 0.2X = 0.5$$

$$8.5 = 0.2X \quad X = 8.5 / 0.2 = \underline{42.5 \text{ lbs}}$$

$$\text{SOC: } d^2\pi/dX^2 = -0.2 < 0, \text{ which satisfies SOC for maximum}$$

**13) (8 pts. total)** This table reports the costs (\$/week) to produce organic eggs (dozens/week).

Dozens of Eggs	Fixed Cost	Variable Cost	Total Cost	Marginal Cost	Average Total Cost
120	100	125	225	--	1.88
130	100	135	235	1.00	1.81
140	100	150	250	1.50	1.79
150	100	175	275	2.50	1.83

**13a) (3 pts.)** Using the table above, show how to calculate Total Cost, Marginal Cost & Average Total Cost, then fill in the table's missing values. Show your work for potential partial credit.

$$TC = FC + VC = 100 + 125 = 225$$

$$MC = \Delta TC / \Delta Q = (235 - 225) / (130 - 120) = 10 / 10 = 1.0$$

**13b) (2 pts.)** Based on the information in the table, what is the profit maximizing dozens of eggs to produce if organic eggs sell for \$2.00/dozen?

*Profit max occurs where  $P = MC$ , which here is \$2.00, which is half way between \$1.50 and \$2.50, so at **Q = 145**.*

**13c) (3 pts.)** Based on your Average Total Cost numbers in the table, if the farm produces and sells this many dozens per week, will it earn a positive economic profit? How do you know?

*It will earn positive profit because  $ATC < \text{the price } P$ .*

**14) (14 pts. total)** In 2012 you bought a tractor for **\$100,000**.

**14a) (2 pts.)** For your farm accounts you plan to keep the tractor for 4 years. Calculate annual depreciation for the tractor assuming a **\$40,000 salvage value**. Fill in the table using **Straight Line Depreciation**. Show your work for potential partial credit.

Year	Depreciation During Year	Value at Year End
2012	\$15,000	$\$100,000 - \$15,000 = \$85,000$
2013	\$15,000	\$70,000
2014	\$15,000	\$55,000
2015	\$15,000	\$40,000

$$\begin{aligned} \text{Deprec} &= 1/\text{UsefulLife}(\text{Price} - \\ &\text{SalvageValue}) = \\ &(1/4) * (100,000 - 40,000) = \\ &15,000 \end{aligned}$$

**14b) (2 pts.)** You have been depreciating the tractor you bought for \$100,000 for tax purposes using the IRS tax table below. Enter depreciation claimed in 2012 and 2013 in the table below.

Year	Tax Year	Depreciation Rate	Depreciation Claimed
1	2012	4.57%	$\$100,000 \times 4.57\% = \$4,570$
2	2013	26.58%	$\$100,000 \times 26.58\% = \$26,580$
3	2014	20.65%	
4	2015	14.06%	
5	2016	10.04%	
6	2017	8.73%	
7	2018	8.73%	
8	2019	6.64%	

**14c) (2 pts.)** What is your income tax basis in the tractor at the beginning of 2014?

$$\text{Basis} = \text{purchase price} - \text{total depreciation claimed} = 100,000 - 4,570 - 26,580 = \$68,850$$

**14d) (2 pts.)** If you sold the tractor at the beginning of 2014 for \$40,000, how much gain or loss would you report on your income tax return?

$$\text{Sale price} < \text{Basis, so you could claim a loss of } \$68,850 - \$40,000 = \$18,850$$

**For parts e through g below, rather than using the table in part a, suppose instead you chose the Section 179 election and deducted the full cost of the tractor for your 2012 taxes.**

**14e) (2 pts.)** What is your income tax basis in the tractor at the beginning of 2014?

$$\text{Basis} = \text{purchase price} - \text{total depreciation claimed} = 100,000 - 100,000 = \$0 \text{ Basis}$$

**14f) (2 pts.)** If you sold the tractor at the beginning of 2014 for \$40,000, how much gain or loss would you report on your income tax return? Which of the following taxes would be owed for this gain: ordinary income, self-employment, and/or capital gains?

$$\text{Gain} = \text{Sale Price} - \text{Basis} = \$40,000 - \$0 = \$40,000$$

You would owe only ordinary income tax on this gain.

**14g) (2 pts.)** Briefly explain the tax benefit that farmers gain by choosing the Section 179 election for depreciating purchased machinery like this tractor.

*In short-term, reduce your taxable income by the amount you claim, which may put you in a lower tax bracket for some of your income, also delays any taxes due to the future years. In longer term, **you avoid paying the self-employment tax**, since when do sell asset, the gain is only taxed as ordinary income, but the avoided taxes when 1<sup>st</sup> claimed the deduction reduced both ordinary income and self-employment taxes due.*

**15) (12 pts. total)** Use the simplified Balance Sheet and Income Statement below to answer these questions. Show your work for potential partial credit.

<b>BALANCE SHEET</b>	<b>12/31/2013</b>	<b>12/31/2012</b>		<b>12/31/2013</b>	<b>12/31/2012</b>
Current Assets	250,000	200,000	Current Liabilities	180,000	130,000
Non-Current Assets	550,000	530,000	Non-Current Liabilities	280,000	250,000
			Total Liabilities	460,000	380,000
			Equity	340,000	350,000
Total Assets	800,000	730,000	Total Liabilities and Equity	800,000	730,000

**15a) (2 pts.)** What is the Current Ratio on 12/31/2013?

$$CR = \text{current assets} / \text{current liabilities} = 250,000 / 180,000 = 1.39$$

**15b) (2 pts.)** What is the Debt to Asset Ratio on 12/31/2013?

$$D:A = \text{total liabilities} / \text{total assets} = 460,000 / 800,000 = 0.575$$

**INCOME STATEMENT 12/31/2012 to 12/31/2013**

Crop and Livestock Sales	290,000
Operating Expenses	160,000
Interest Expenses	30,000
Net Farm Income from Operations	100,000

Assume the farm family paid themselves \$50,000 for their labor & management.

**15c) (2 pts.)** What is this farm's Return on Assets?

$$ROA = \text{Net Farm Income from Operations} + \text{Interest} - \text{Unpaid Labor \& Mgmt} = 100,000 + 30,000 - 50,000 = \underline{\underline{80,000}}$$

**15d) (2 pts.)** What is this farm's Rate of Return on Assets?

$$ROROA = ROA / \text{Avg Assets} = 80,000 / \frac{1}{2}(800,000 + 730,000) = \underline{\underline{10.46\%}}$$

**15e) (2 pts.)** What is this farm's Return on Equity?

$$ROE = ROA - \text{Interest} = 80,000 - 30,000 = \underline{\underline{50,000}}$$

**15f) (2 pts.)** What is this farm's Rate of Return on Equity?

$$ROROE = ROE / \text{Avg Equity} = 50,000 / \frac{1}{2}(340,000 + 350,000) = \underline{\underline{14.49\%}}$$