

Practice Pre-exam on Background Concepts – Solutions

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Multiple-Choice / True-False Questions – 2 points each

_____ 1. Solve the following expression for y : $x = (3y - 4)/5$.

- A. $y = (5x - 4)/3$
- B. $y = (3x - 4)/5$
- C. $y = (4x + 3)/5$
- D. $y = (5x + 4)/3$**
- E. $y = (x + 5)/3 - 4$

_____ 2. What is the relationship between x and y in this function?

- A. THEY MOVE IN THE SAME DIRECTION.**
- B. They move in opposite directions from one another.
- C. There is no connection between x and y in this function.
- D. There is not enough information to answer this question.

_____ 3. Solve the following expression for y : $ay = x^2 - by$.

- A. $y = (x^2 - by)/a$
- B. $y = x^2/(a - b)$
- C. $y = x^2/(a + b)$**
- D. $y = \sqrt{(a + b)x}$
- E. $y = \sqrt{(a - b)x}$

_____ 4. The grading scale for a particular class incorporates the following weights:

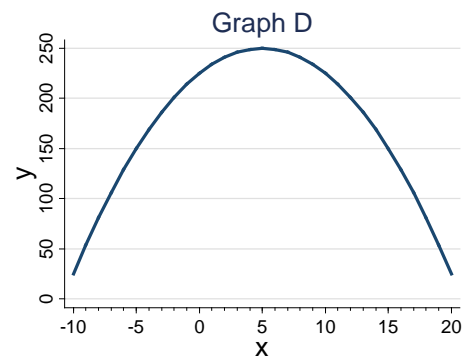
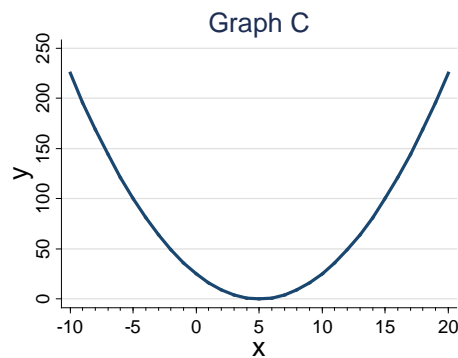
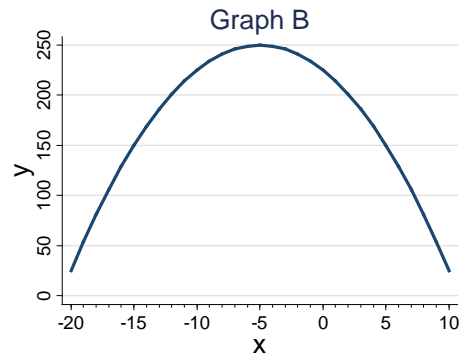
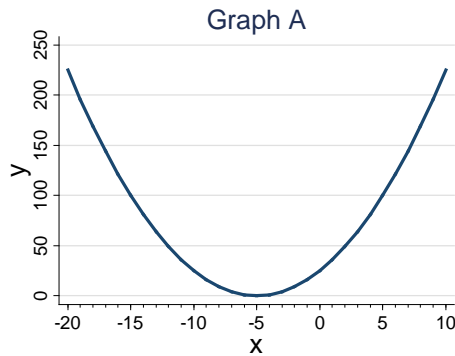
- Midterm exam = 30% of your final grade
- Final exam = 40% of your final grade
- Homework assignments = 15% of your final grade
- Project = 15% of your final grade

If you score 85 on the midterm exam, 75 on the final exam, 100 on the homework assignments and 95 on the project, what will be your overall score in this class?

- A. 88.75
- B. 84.75**
- C. 90.00
- D. 95.25
- E. None of the above; the correct answer is _____.

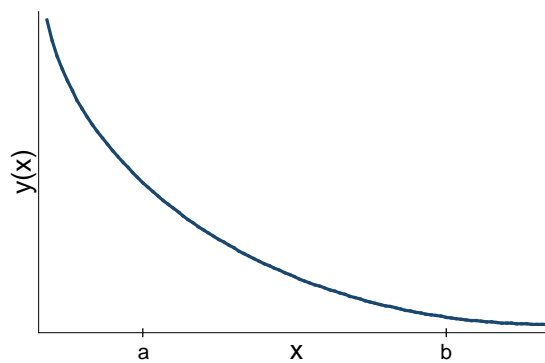
$$\text{Score} = 85 \times 0.30 + 75 \times 0.40 + 100 \times 0.15 + 95 \times 0.15 = 84.75$$

_____ 5. Which of the following graphs depicts the function $y = (x - 5)^2$?



Graph C. Notice that the $y = 0$ when $x = 5$ and positive for any other value.

_____ 6. If a and b are both values of x with $a < b$, which of the following statements is most correct?

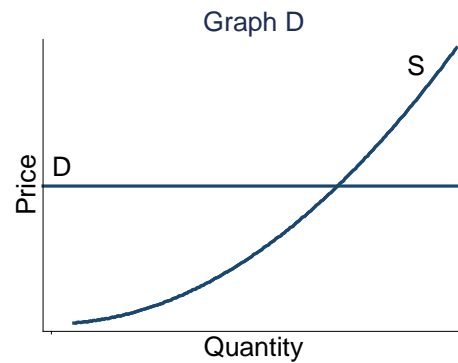
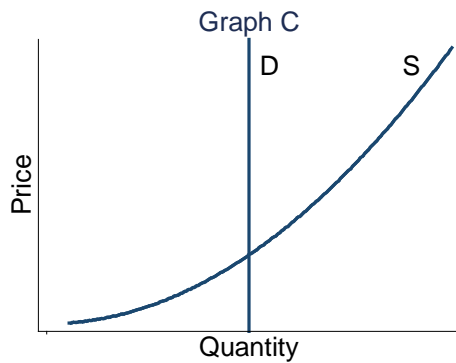
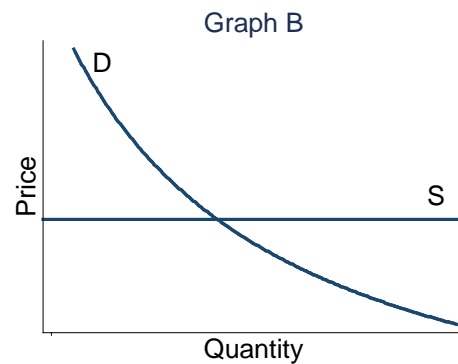
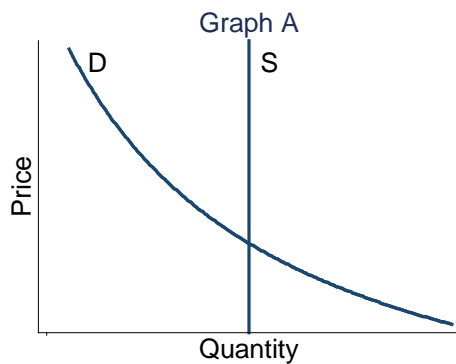


- A. $y\left(\frac{a+b}{2}\right) > \frac{y(a)+y(b)}{2}$
- B. $y\left(\frac{a+b}{2}\right) < \frac{y(a)+y(b)}{2}$ **CORRECT ANSWER**
- C. $y\left(\frac{a+b}{2}\right) = \frac{y(a)+y(b)}{2}$
- D. There is not enough information to answer this question.

- _____ 7. For most goods, the demand curve is _____, while the supply curve is _____.
- A. upward sloping; downward sloping
 - B. DOWNWARD SLOPING; UPWARD SLOPING**
 - C. flat; downward sloping
 - D. upward sloping; flat
 - E. flat; flat

- _____ 8. In a competitive market with a normal good, a decrease in demand results in a
- A. higher equilibrium price and lower equilibrium quantity.
 - B. LOWER EQUILIBRIUM PRICE AND LOWER EQUILIBRIUM QUANTITY.**
 - C. lower equilibrium price and higher equilibrium quantity.
 - D. higher equilibrium price and higher equilibrium quantity.

- _____ 9. Which of the following graphs depicts a market with a perfectly inelastic supply?



Graph A depicts a market with perfectly inelastic supply. In such a market, quantity supplied is unaffected by price.

Use the following information to answer the next five questions:

During the first seven football games of the season, the Atoms' scores were as follows: 17, 28, 35, 20, 24, 21, and 31.

_____ 10. What is the Atoms' mean score through the first seven games of this season?

The mean score is the arithmetic average of the scores throughout the season:

$$\mu = \frac{17 + 28 + 35 + 20 + 24 + 21 + 31}{7} = 25.14$$

_____ 11. What is the Atoms' median score?

The median score is the middle value when they are arranged in ascending order: 17, 20, 21, 24, 28, 31, 35. Thus, the median score is 24.

_____ 12. What is the (population) variance of the Atoms' scores?

The variance is the sum of the squared deviations from the mean divided by the size of the population:

$$\begin{aligned} \sigma^2 = & [(17 - 25.14)^2 + (28 - 25.14)^2 + (35 - 25.14)^2 \\ & + (20 - 25.14)^2 + (24 - 25.14)^2 \\ & + (21 - 25.14)^2 + (31 - 25.14)^2] \frac{1}{7} = 35.84 \end{aligned}$$

_____ 13. What is the (population) standard deviation of the Atoms' scores?

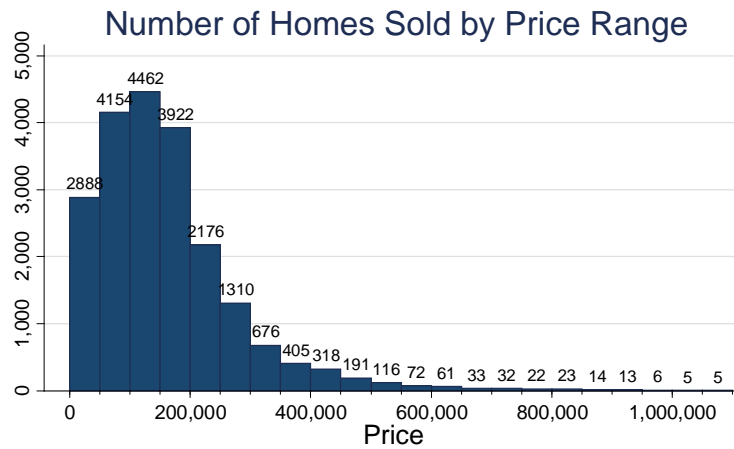
The standard deviation is the square root of the variance:

$$\sigma = \sqrt{\sigma^2} = \sqrt{35.84} = 5.99$$

_____ 14. Through the same point in the season, the variance of the Banana Slugs scores is 48.32. Assuming both team's scores are normally distributed, are the Atoms more or less likely to score 40 or more points in a given game? Explain.

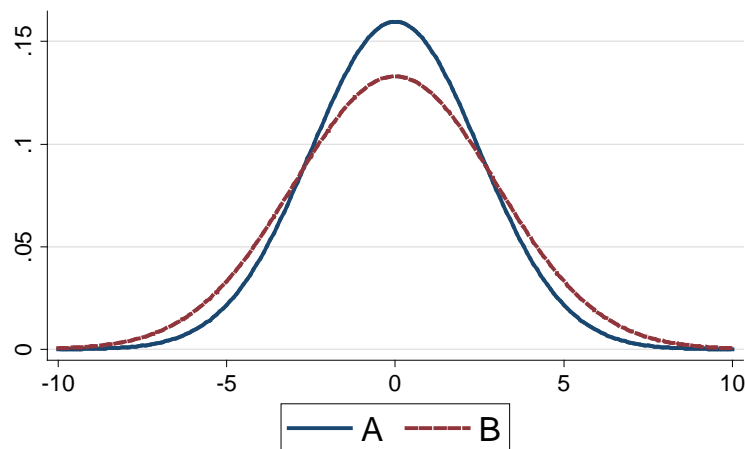
Less likely, because the variance of their scores is lower.

_____ 15. Below is a histogram of the prices of home sales in Kansas in 2010. Based on the shape of this graph, which of the following statements is most correct?



- A. **THE AVERAGE SALE PRICE IS LIKELY HIGHER THAN THE MEDIAN SALE PRICE.**
- B. The median sale price is likely higher than the average sale price.
- C. The average sale price is likely equal to the median sale price.
- D. There is not enough information to determine the relationship between the average price and the median price.

_____ 16. Which of the two functions graphed below has the larger variance?



- A. Function A
- B. **FUNCTION B**
- C. They both have the same variance.
- D. There is not enough information to answer this question.

- _____ 17. The variables x and y have a correlation coefficient $\rho = -0.7$. Based on this information, which of the following statements is most correct.
- A. x and y tend to move in the same direction as one another.
 - B. x AND y TEND TO MOVE IN THE OPPOSITE DIRECTION FROM ONE ANOTHER.**
 - C. There is very little systematic relationship between x and y .
 - D. y is generally 70 percent smaller than x .
 - E. x is generally 70 percent smaller than y .
- _____ 18. **TRUE** or False: On the balance sheet, total assets must always equal the sum of total liabilities plus equity.
- _____ 19. **TRUE** or False: The time dimension is important in financial statement analysis. The balance sheet shows the firm's financial position at a given point in time, the income statement shows results over a period of time, and the statement of cash flows reflects specific changes in accounts over that period of time.
- _____ 20. Which of the following items CANNOT be found on a firm's balance sheet under current liabilities?
- A. Accounts payable
 - B. Short-term notes payable to the bank
 - C. Accrued wages
 - D. COST OF GOODS SOLD**
 - E. Accrued payroll taxes

Note: Cost of goods sold appears on the income statement, not the balance sheet

- _____ 21. Wu Systems has the following balance sheet:

Cash	\$ 100	Accounts payable	\$ 200
Accounts receivable	650	Accruals	350
Inventory	<u>550</u>	Notes payable	<u>350</u>
Current assets	\$1,300	Current liabilities	\$ 900
Net fixed assets	1,000	Long-term debt	600
		Common equity	300
		Retained earnings	<u>500</u>
Total assets	<u>\$2,300</u>	Total liab. & equity	<u>\$2,300</u>

How much net working capital does the firm have?

- A. \$675
- B. \$750**
- C. \$825
- D. \$908
- E. None of the above; the correct answer is _____.

Net working capital is current assets minus accounts payables and accruals.

- _____ 22. At the end of last year, Brown Fashions Inc.'s balance sheet showed total common equity of \$4,050,000 and 200,000 shares of stock outstanding. This year, the firm had \$450,000 of net income, and it paid out \$100,000 as dividends. What is the book value per share at the end of this year, assuming no common stock was either issued or retired during the year?
- A. \$20.90
B. \$22.00
 C. \$23.10
 D. \$24.26
 E. None of the above; the correct answer is _____.

$$BVPS = (4,050,000 + 450,000 - 100,000) / 200,000 = 22.00$$

- _____ 23. During 2008, Bascom Bakery paid out \$33,525 of common dividends. It ended the year with \$197,500 of retained earnings versus the prior year's retained earnings of \$159,600. How much net income did the firm earn during the year?
- A. **\$71,425**
 B. \$74,996
 C. \$78,746
 D. \$82,683
 E. \$86,818

$$\text{Net income} = \text{dividend paid plus additions to retained earnings} = 33,525 + (197,500 - 159,600) = 33,525 + 37,900 = 71,425.$$

- _____ 24. True or ***FALSE***: Depreciation appears on the income statement because it reflects actual cash costs to the company.
- _____ 25. True or ***FALSE***: Consider the following balance sheet, for Games Inc. Because Games has \$800,000 of retained earnings, we know that the company would be able to pay cash to buy an asset with a cost of \$200,000.

Cash	\$ 50,000	Accounts payable	\$ 100,000
Inventory	200,000	Accruals	<u>100,000</u>
Accounts receivable	<u>250,000</u>	Total Curr. Liab.	\$ 200,000
Total Curr. Assets	<u>\$ 500,000</u>	Debt	200,000
Net fixed assets	\$ 900,000	Common stock	200,000
		Retained earnings	<u>800,000</u>
Total assets	<u>\$1,400,000</u>	Total L & E	<u>\$1,400,000</u>

- _____ 26. On its 12/31/08 balance sheet, Barnes Inc showed \$510 million of retained earnings, and exactly that same amount was shown the following year. Assuming that no earnings restatements were issued, which of the following statements is CORRECT?
- A. If the company lost money in 2008, it must have paid dividends.
 - B. The company must have had zero net income in 2008.
 - C. The company must have paid out half of its 2008 earnings as dividends.
 - D. The company must have paid no dividends in 2008.
 - E. **DIVIDENDS COULD HAVE BEEN PAID IN 2008, BUT THEY WOULD HAVE HAD TO EQUAL THE EARNINGS FOR THE YEAR.**
- _____ 27. A loss incurred by a corporation
- A. Must be carried forward unless the company has had 2 loss years in a row.
 - B. **CAN BE CARRIED BACK 2 YEARS, THEN CARRIED FORWARD UP TO 20 YEARS FOLLOWING THE LOSS.**
 - C. Can be carried back 5 years and forward 3 years.
 - D. Cannot be used to reduce taxes in other years except with special permission from the IRS.
 - E. Can be carried back 3 years or forward 10 years, whichever is more advantageous to the firm.
- _____ 28. **TRUE** or False: The income statement shows the difference between a firm's income and its costs – i.e., its profits – during a specified period of time. However, not all reported income comes in the form of cash, and reported costs likewise may not be consistent with cash outlays. Therefore, there may be a substantial difference between a firm's reported profits and its actual cash flow for the same period.
- _____ 29. A tax-exempt bond issued by the State of Pennsylvania provides a 9% yield. What yield on a Synthetic Chemical Company bond would cause the two bonds to provide the same after-tax rate of return to an investor in the 35% tax bracket?
- A. 3.15%
 - B. 25.71%
 - C. 5.85%
 - D. **13.85%**
 - E. None of the above; the correct answer is _____.

$$9\% = y\% \times (1 - 0.35) \Rightarrow y\% = 9\%/0.65 = 13.85\%$$

_____ 30. C. F. Lee Inc. has the following income statement. How much after-tax operating income (ATOI) does the firm have? Note: Sometimes ATOI is also called net operating profit after tax (NOPAT).

Sales	\$2,850.00
Costs	1,850.00
Depreciation	<u>192.00</u>
EBIT	\$ 808.00
Interest expense	<u>285.00</u>
EBT	\$ 523.00
Taxes (35%)	<u>183.05</u>
Net income	<u>\$ 339.95</u>

- A. \$427.78
- B. \$473.99
- C. **\$525.20**
- D. \$498.94
- E. None of the above; the correct answer is _____.

$$\text{ATOI} = \text{EBIT} \times (1 - t) = 808 \times (1 - 0.35) = 525.20$$

_____ 31. What is Lee's EBIDTA in the previous question?

- A. **\$1,000.00**
- B. \$808.00
- C. \$2,565.00
- D. \$339.95
- E. None of the above; the correct answer is _____.

$$\text{EBIDTA} = \text{EBIT} + \text{depreciation} + \text{amortization} = 808 + 192 = 1,000$$

Use the following information to answer the next four questions: Frederick Inc.’s most recent income statement (in MILLIONS of dollars) is as follows:

Sales	\$2,250
Costs	1,400
Depreciation	<u>250</u>
EBIT	\$ 600
Interest expense	<u>70</u>
EBT	\$ 530
Taxes (40%)	<u>212</u>
Net income	<u>\$ 318</u>

Frederick Inc. has 70 million shares of common stock outstanding. During the year represented by this income statement, Frederick paid dividends of \$2.50 per share. Frederick’s stock price is currently \$35.23, and total common equity from Frederick’s balance sheet is \$1,500 million.

_____ 32. What is Frederick’s earnings per share (EPS).

- A. **\$4.54**
- B. \$8.57
- C. \$14.09
- D. \$2.50
- E. None of the above; the correct answer is _____.

$$\text{EPS} = \text{net income} / \text{shares outstanding} = 318 / 70 = 4.54$$

_____ 33. By how much did Frederick’s retained earnings increase or decrease this year?

- A. \$318 million
- B. **\$143 MILLION**
- C. \$175 million
- D. Retained earnings fell by \$318 million
- E. None of the above; the correct answer is _____.

$$\text{Change in retained earnings} = \text{net income} - \text{dividends paid} = 318 - 70 \times 2.50 = 143$$

_____ 34. What is Frederick’s book value per share (BVPS)?

- A. \$35.23
- B. \$4.54
- C. \$14.09
- D. **\$21.43**
- E. None of the above; the correct answer is _____.

$$\text{BVPS} = \text{Book value of equity} / \text{shares outstanding} = 1,500 / 70 = 21.43$$

- _____ 35. What is the total market value of Frederick's common equity?
- A. **\$2,466 MILLION**
 - B. \$1,500 million
 - C. \$318 million
 - D. \$70 million
 - E. None of the above; the correct answer is _____.

Market value of common equity = share price \times shares outstanding = $35.23 \times 70 = 2,466$