

Student: Jennifer Brown
Submitted: 12/13/16 2:03pm

Instructor: Robert Davy
Course: MBA-501-Q1470-16TW1

Assignment: 9-1 Final Practice Exam

16. Solve by the elimination method.

$$\begin{aligned}5x + 6y &= 4 \\10x + 12y &= 8\end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The solution is
(Simplify your answer. Type an ordered pair.)
- ☒ B. There are infinitely many solutions.
- ☐ C. There is no solution.

YOU ANSWERED: nothing

both equations
Plug ¹ into the graphing calculator. If there
is one straight line there are
infinitely many solutions.

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25. Find $f'(x)$ for the following function. Then find $f'(9)$, $f'(0)$, and $f'(-6)$.

$$f(x) = -8x^2 + 3x$$

$$f'(x) = -16x + 3$$

always subtract 1
from exponent

Select the correct choice below and fill in the answer box within your choice, if needed.

- ☒ A. $f'(9) = -141$
(Simplify your answer, if needed)
- ☐ B. The answer is not a real number.
- ☐ C. The answer is undefined.

Select the correct choice below and fill in the answer box within your choice, if needed.

- ☒ A. $f'(0) = 3$
(Simplify your answer.)
- ☐ B. The answer is not a real number.
- ☐ C. The answer is undefined.

Select the correct choice below and fill in the answer box within your choice, if needed.

- ☒ A. $f'(-6) = 99$
(Simplify your answer.)
- ☐ B. The answer is not a real number.
- ☐ C. The answer is undefined.

YOU ANSWERED: nothing

nothing

nothing

nothing

$$f'(x) = -8(2) = -16x + 3$$

$$f'(9) = -16(9) + 3 = -141$$

$$f'(0) = -16(0) + 3 = 3$$

$$f'(-6) = -16(-6) + 3 = 99$$

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4. Prepare a frequency distribution for the given data with columns for intervals and frequencies.
 The following is the number of bonus points that 24 students have gotten for extra work. Use six intervals, starting with 0 - 49.

28 53 137 181 235 247 161 143 97 22 62 261
 59 136 169 232 184 118 50 100 150 199 187 298

☐ A.

Interval Frequency	
0 - 49	2
50 - 99	5
100 - 149	5
150 - 199	5
200 - 249	4
250 - 299	2

☒ B.

Interval Frequency	
0 - 49	2
50 - 99	5
100 - 149	5
150 - 199	7
200 - 249	3
250 - 299	2

☐ C.

Interval Frequency	
0 - 49	2
50 - 99	5
100 - 149	4
150 - 199	7
200 - 249	3
250 - 299	2

☐ D.

Interval Frequency	
0 - 49	2
50 - 99	4
100 - 149	6
150 - 199	7
200 - 249	3
250 - 299	2

YOU ANSWERED: nothing

Ⓐ How many #s are between 0-49? 2
 etc
 etc
 etc

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17. For a segment of a radio show, a disc jockey can play 6 records. If there are 10 records to select from, in how many ways can the program for this segment be arranged?

151,200 ways

YOU ANSWERED: nothing

$$\underline{10P_6} = \frac{10!}{(10-6)!} = \frac{10!}{4!}$$

$$\textcircled{A} \frac{10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{4 \times 3 \times 2 \times 1} = \boxed{151,200}$$

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1. Tuition of \$1274 will be due when the spring term begins in 10 months. What amount should a student deposit today, at 7.43%, to have enough to pay the tuition?

The student should deposit \$ 1200

(Simplify your answer. Round to the nearest dollar as needed.)

Computer generated answer is wrong.

$$P = \frac{A}{\left(1 + \frac{r}{n}\right)^{nt}}$$

$$A = 1274$$

$$r = \frac{7.43}{100} = 0.0743$$

↑
always 100

$$n = 10 \text{ mts}$$

$$t = \frac{10 \text{ mts}}{12 \text{ mts}} = 0.83$$

↑
always 12

$$\frac{1274}{\left(1 + \frac{0.0743}{10}\right)^{10(0.83)}}$$

$$= 1198.0$$

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8. Assume that a demand equation is given by $q = 8000 - 100p$. Find the marginal revenue for the given production levels (values of q). (Hint: Solve the demand equation for p and use $R(q) = qp$.)

a. 2500 units

The marginal revenue at 2500 units is 30 . (Simplify your answer.)

b. 4000 units

The marginal revenue at 4000 units is 0 . (Simplify your answer.)

c. 5000 units

The marginal revenue at 5000 units is -20 . (Simplify your answer.)

Ⓐ Setup

$$\frac{8000 - q}{100} = 80 - \frac{q}{100}$$

Ⓑ Multiply everything by q

$$q\left(80 - \frac{q}{100}\right) = 80q - \frac{q^2}{100} = \left(80 - \frac{q}{50}\right)$$

$$\boxed{2500}$$

$$80 - \frac{2500}{50}$$

$$= 30$$

$$\boxed{4000}$$

$$80 - \frac{4000}{50}$$

$$= 0$$

$$\boxed{5000}$$

$$80 - \frac{5000}{50}$$

$$= -20$$

Student: Jennifer Brown**Instructor:** Robert Davy**Submitted:** 12/14/16 9:00pm**Course:** MBA-501-Q1470-16TW1**Assignment:** 9-1 Final Practice Exam

17. An electronics company produces transistors, resistors, and computer chips. Each transistor requires 3 units of copper, 2 units of zinc, and 1 unit of glass. Each resistor requires 3, 1, and 2 units of the three materials, and each computer chip requires 2, 1, and 2 units of these materials, respectively. How many of each product can be made with 2790 units of copper, 1410 units of zinc, and 1875 units of glass? Solve this exercise by using the inverse of the coefficient matrix to solve a system of equations.

The company can make 315 transistors, 285 resistors, and 495 computer chips.

YOU ANSWERED: nothing

nothing

nothing

use desktop excel sheet
(on jennifers computer)

$$\begin{array}{l} \text{copper} \\ \text{zinc} \\ \text{glass} \end{array} \begin{bmatrix} 3 & 3 & 2 \\ 2 & 1 & 1 \\ 1 & 2 & 2 \end{bmatrix} \times \begin{array}{l} x \\ y \\ z \end{array} = \begin{bmatrix} 2790 \\ 1410 \\ 1875 \end{bmatrix}$$

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2. The population of a certain country is approximated by the following equation, where x is the number of years since 1980 and P is the population in millions.

$$P = 2.906x + 126.756$$

Determine the year in which the country had or will have a population of 185,105,000.

In what year is the population 185,105,000?

2000

YOU ANSWERED: nothing

Use graphing calculator

(A)

plug in $\rightarrow 185.105 = (2.906x) + (126.756)$

$$x = 20.08$$

(B) $20.08 + 1980 = 2000.08$
= ^{year} 2000

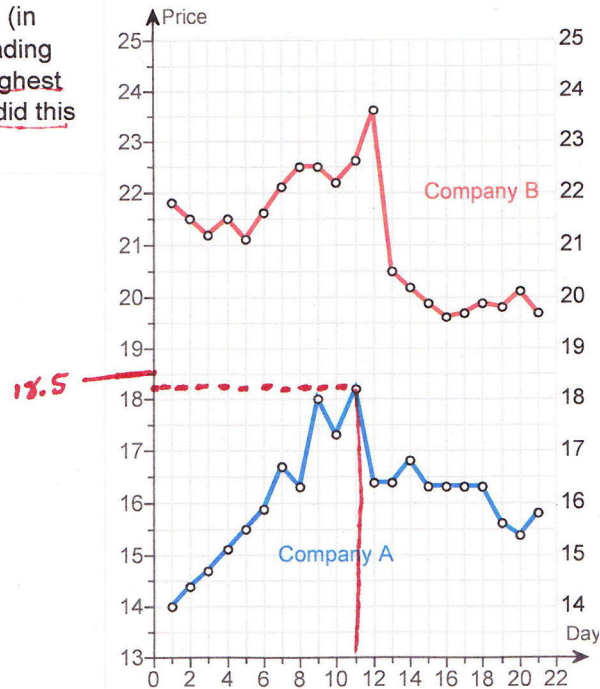
Student: Jennifer Brown
Submitted: 12/13/16 1:30pm

Instructor: Robert Davy
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Assignment: 9-1 Final Practice Exam

1. The graph to the right shows the closing share prices (in dollars) for Company A and Company B on the 21 trading days of the month of January, 2013. What was the highest closing share price for Company A and on what day did this occur?

The highest closing share price for Company A was
\$ 18.20 on day 11.
(Round to the nearest ten cents as needed.)



There is another
chart similar, very
correct question.

YOU ANSWERED: nothing

nothing

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Assignment: 9-1 Final Practice Exam

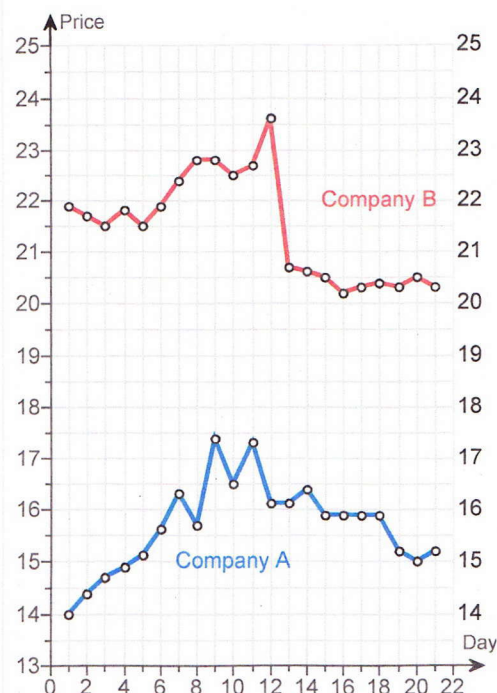
15. The graph to the right shows the closing share prices (in dollars) for Company A and Company B on the 21 trading days of the month of January, 2013. What was the approximate closing share price for Company A on day 21? Company B?

The closing share price for Company A on day 21 was
\$ 15.20

(Round to the nearest ten cents as needed.)

The closing share price for Company B on day 21 was
\$ 20.30

(Round to the nearest ten cents as needed.)



YOU ANSWERED: nothing

nothing

just look at the chart

Supply: $p = q^2 + 30q$ Demand: $p = -2q^2 + 10q + 3300$

The equilibrium quantity is $q = 30$ (Round to the nearest whole number as needed.)

The equilibrium price is $p = \$1,800$ (Round to the nearest dollar as needed.)

Find the equilibrium quantity & equilibrium ~~supply~~ price for the commodity whose Supply & demand functions are given.

(A) Rewrite question: $-2q^2 + 10q + 3300 = q^2 + 30q$

(B) Turn 2nd $\frac{1}{2}$ in negatives: $-2q^2 + 10q + 3300 - q^2 - 30q = 0$

(C) Rewrite again

$$-3q^2 - 20q + 3300 = 0$$

(A) Multiply everything by -1 (always -1). Everything basically goes opposite, AGAIN.

$$3q^2 + 20q - 3300 = 0$$

(B) $a = 3$ $b = 20$ $c = -3300$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

(1) $\frac{-20 \pm \sqrt{20^2 - 4(3)(-3300)}}{2(3)}$

(2) $\frac{-20 \pm \sqrt{400 + 39600}}{6}$

(3) $\frac{-20 \pm \sqrt{\frac{40000}{6}}}{6}$

(3) $\frac{-20 \pm \sqrt{\frac{40000}{6}}}{6}$

(4) $\frac{-20 \pm 200}{6}$

(5) $\frac{-20 + 200}{6}$ or $\frac{-20 - 200}{6}$

$= 30$

$= \frac{-36.6}{6}$
Never use negative

$q = 30$

$$-2(30)^2 + 10(30) + 3300 = 1800$$

video

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11. Find the expected value for the random variable.

z	9	12	15	18	21
$P(z)$	0.15	0.21	0.40	0.17	0.07

$E(z) =$ 14.4 (Type an integer or a decimal.)

YOU ANSWERED: nothing

$$9(0.15) + 12(0.21) + 15(0.40) + 18(0.17) + 21(0.07) = \boxed{14.4}$$

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23. An investment of \$31,000 was made by a business club. The investment was split into three parts and lasted for one year. The first part of the investment earned 8% interest, the second 6%, and the third 9%. Total interest from the investments was \$2370. The interest from the first investment was 3 times the interest from the second. Find the amounts of the three parts of the investment.

- * What is the amount of the first part of the investment? \$ 18,000
 y What is the amount of the second part of the investment? \$ 8,000
 z What is the amount of the third part of the investment? \$ 5,000

YOU ANSWERED: nothing

nothing

nothing

$$0.08x + 0.06y + 0.09z = 2370$$

X = 1st investment

Y = 2nd investment

Z = 3rd investment

$$X + Y + Z = \$31,000$$

$$0.08x = 3(0.06y)$$

$$x = \frac{0.18y}{0.08}$$

$$x = 2.25y$$

$$2.25y + y + z = 31,000$$

$$3.25y + z = 31,000$$

$$0.08(2.25y) + 0.06y + 0.09z = 2370$$

$$0.18y + 0.06y + 0.09z = 2370$$

$$0.24y + 0.09z = 2370$$

$$3.25y + z = 31,000$$

$$z = 31,000 - 3.25y$$

$$0.24y + 0.09(31,000 - 3.25y) = 2370$$

$$0.24y + 0.09(31,000 - 3.25y) = 2370$$

$$0.24y + 2790 - 0.2925y = 2370$$

$$-0.0525y = 2370 - 2790$$

$$-0.0525y = -420$$

$$y = \frac{-420}{-0.0525}$$

$$y = 8000$$

$$y = 8000$$

$$3.25(8000) + z = 31,000$$

$$26,000 + z = 31,000$$

$$z = 31,000 - 26,000$$

$$z = 5000$$

$$y = 8000 \quad z = 5000$$

$$x + 8000 + 5000 = 31,000$$

$$x + 13,000 = 31,000$$

$$x = 31,000 - 13,000$$

$$x = 18,000$$

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6. Find the APY corresponding to the following nominal rate.

7% compounded quarterly

The APY is 7.19 %.

(Type an integer or a decimal. Round to the nearest hundredth as needed.)

YOU ANSWERED: nothing

$$\left(1 + \frac{r}{m}\right)^m - 1$$

$$r = 0.07$$

$$m = 4 \text{ (for quarterly)} \rightarrow m = 2 \text{ (for semiannually)}$$

$$= \left(1 + \frac{0.07}{4}\right)^4 - 1$$

$$= 0.07185$$

$$= 0.0719$$

⑥ Convert to % using percentage calculator (calculator.saspi.com)

7.19

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19. To save for retirement, Karla Harby put \$650 each month into an ordinary annuity for 20 years. Interest was compounded monthly. At the end of the 20 years, the annuity was worth \$267,295. What annual interest rate did she receive?

The interest rate she received was approximately 5.00 %.
(Round to two decimal places as needed.)

YOU ANSWERED: nothing

use excel

$$A = 267,295$$

$$R = 650$$

$$n = 12 \text{ (interest compounded monthly)}$$

$$t = 20 \text{ (years)}$$

use excel

$$\textcircled{A} = \text{RATE}(12 * 20, -650, , 267295) \text{ ENTER}$$

↑

two
commas

$\textcircled{B}$ Right click cell, format cells, percentage, 4 decimal place
 $= 0.4170$

$\textcircled{C}$ (regular calculator)
 $0.4170 * 12 = 5.004$

$$= \boxed{5.00}$$

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19. A car dealership has 8 red, 13 silver, and 4 black cars on the lot. Ten cars are randomly chosen to be displayed in front of the dealership. Complete parts (a) through (c) below.

(a) Find the probability that 4 cars are red and the rest are silver.

0.0367
(Round to four decimal places as needed.)

(b) Find the probability that 6 cars are red and 4 are black.

0.000009
(Round to six decimal places as needed.)

(c) Find the probability that exactly 8 cars are red.

0.00004
(Round to five decimal places as needed.)

red cars = 8
Silver cars = 13
black = 4
total = 25

(A) How many cars are you picking between A & B? ~~4~~ 4 + 6 = 10

$$(B) 25C_{10} = \frac{25!}{(25-10)! 10!} = 3,268,760$$

Answer A)

$$\begin{matrix} 8C_4 & \times & 13C_6 \\ \uparrow & & \uparrow \\ \text{total red} & & \text{total silver} \end{matrix} \div 3268760$$

$$\frac{8!}{(8-4)! 4!} \times \frac{13!}{(13-6)! 6!} = \frac{8!}{4! 4!} \times \frac{13!}{7! 6!}$$

$$= \frac{8!}{(4!)(4!)} \times \frac{13!}{(7!)(6!)} = \frac{70 \times 1716}{3,268,760}$$

$$= 0.03674 = 0.0367$$

Answer B)

$$\begin{matrix} 8C_6 & \times & 4C_4 \\ \uparrow & & \uparrow \\ \text{total black} & & \end{matrix} \div 3268760$$

$$\frac{8!}{(8-6)! 6!} \times \frac{4!}{(4-4)! 4!} = \frac{8!}{2! 6!} \times \frac{4!}{4!}$$

$$= \frac{8!}{(2!)(6!)} \times \frac{4!}{4!} = \frac{28 \times 1}{3,268,760}$$

$$= 0.0000085 = 0.000009$$

Answer C)

$$\begin{matrix} 10C_8 \\ \uparrow \\ \text{total cars} \end{matrix} \div 3,268,760$$

$$\frac{10!}{(10-8)! 8!} = \frac{10!}{(2!)(8!)}$$

$$= \frac{10!}{(2!)(8!)} = \frac{45}{3,268,760}$$

$$= 0.000013 = 0.00001$$

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7. The number of retail drug prescriptions (in millions) can be approximated by

$$y = 84.91x + 2903.36,$$

where $x = 0$ corresponds to the year 2000. Find the approximate number of prescriptions in the following years.

(a) 2002

(b) 2007

(c) Assuming that this model remains accurate, in what year will the number of prescriptions be 5,750,000,000?

(a) In 2002, the approximate number of prescriptions was 3073.18 million.

(Type an integer or decimal rounded to two decimal places as needed.)

(b) In 2007, the approximate number of prescriptions was 3497.73 million.

(Type an integer or decimal rounded to two decimal places as needed.)

(c) The number of prescriptions will be 5,750,000,000 in the year 2033

The year 2000

a) 2002, (2 years away): $84.91(2) + 2903.36 = 3073.18$

b) 2007, (7 years away): $84.91(7) + 2903.36 = 3497.73$

c) When will we get to 5750

$$\frac{5750 - 2903.36}{84.91} = 33.5$$

* don't round

$$33.5 = 33$$

d) $2000 + 33 = 2033$

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15. Use the given table to find the probability of the indicated event. Round your answer to the nearest thousandth.

College students were given three choices of pizza toppings and asked to choose one favorite. The following table shows the results.

toppings	freshman	sophomore	junior	senior
cheese	10	15	24	25
meat	21	25	15	10
veggie	15	10	21	25

A randomly selected student prefers a cheese topping.

- ★ A. .343
B. .116
C. .329
D. .338

YOU ANSWERED: nothing

① Add up all numbers in columns and rows

toppings	freshman	sophomore	junior	senior	
cheese	10	15	24	25	=74
meat	21	25	15	10	=71
veggie	15	10	21	25	=71
=	=46	=50	=60	=60	Absolute total 216

↑
216 students were sampled

② The probability of selecting cheese lover is

$$\frac{\# \text{ cheese lovers}}{\text{total students}} = \frac{74}{216} = 0.3425$$

$$= 0.343$$