

MATH 208 Self-Assessment ■ Duration: 1Hr 30Mins
Student Success Centre
Concordia University

1. Camille and Serena are selling baked goods for a school fundraiser. Customers can either buy a box of 12 cupcakes or a box 6 of brownies. Camille sold 3 cupcake boxes and 14 boxes of brownies for a total of \$130. Serena sold 11 cupcake boxes and 5 brownie boxes for a total of \$106. Find the cost of one box of cupcakes and one box of brownies.
2. Mary would like to get her driver's license. A maximum of 3 driving test attempts are allowed, at 2-month intervals between each test. From past records, it is found that 30% pass on the first try; of those that fail on the first try and take a test a second time, 50% pass; and of those that fail the second time and take the test a third time, 10% pass. What is the probability:
 - a. Mary fails on all three attempts?
 - b. Mary passes the test on her second or on her third attempt?
 - c. Mary fails her first two tests but passes her third test?
3. A basketball team has 5 distinct positions. Out of 8 players, how many starting teams are possible if:
 - a. Distinct positions on the team are not taken into consideration?
 - b. Distinct positions are taken into consideration?
 - c. Distinct positions are not taken into consideration, but either Mike or Ken (but not both) must be on the starting team?
4. Solve the following equations:
 - a. $\log_{10} x + \log_{10}(x + 15) = 2$
 - b. $2^{3x} = \frac{1}{32}$
 - c. $2e^{5x+2} = 8$
 - d. $\log_5(x + 2) + \log_5 x = \log_5(x + 12)$

5. A coffee manufacturer is selling coffee beans to coffee shops. At a price of \$2.28 per pound of coffee beans, the supply of coffee is 7500 million pounds of coffee and the demand is 7900. At the price of \$2.37 per pound of coffee, the supply is 7900 million pounds of coffee and the demand is 7800 million pounds.
- Find the price-supply equation of the form $p = mx + b$.
 - Find the price-demand equation of the form $p = mx + b$.
 - Find the equilibrium point.
 - Graph price-supply equation, the price-demand equation, and the equilibrium point.
6. The marketing research department of a company that manufactures and sells memory chips for microcomputers established the following price-demand, revenue and cost functions:

$$p(x) = 75 - 3x \quad ; \quad R(x) = x(75 - 3x) \quad ; \quad C(x) = 125 + 16x$$

Where $p(x)$ is the wholesale price (in dollars) at which x million chips can be sold, $R(x)$ and $C(x)$ are in millions of dollars. Both functions have a domain of $1 \leq x \leq 20$.

- Find the output that will produce the maximum revenue. What is the maximum revenue?
- Find the break-even points to the nearest thousands chips.
- For what outputs will a loss occur?

NOTE 1 [REFERENCES]:

Some questions in this document have been selected from final exams and midterms at Concordia University.

NOTE 2 [DISCLAIMER]:

*CEGEP Algebra classes cover most of the same material as MATH208. However, MATH208 is a university level, business-oriented Algebra class, and as such, includes new material that is not covered in CEGEP, and that builds a foundation for future JMSB courses, notably COMM308: Introduction to Finance. MATH208 introduces financial notions such as **Present Value, Future Value, Interest and Annuities**, which are fundamental notions of COMM308 and other subsequent Finance classes. We recommend that you familiarise yourself with these notions before taking COMM308. If you need any help with these topics, please book a free Math tutoring session with the Student Success Center through your MyConcordia portal or by clicking [here](#).*

ANSWER KEY:

1. The *box of cupcakes* costs \$6 and the *box of brownies* costs \$8.

2.

a.	0.315
b.	0.385
c.	0.035

3.

a.	56 teams
b.	6720 teams
c.	30 teams

4.

a.	$x = 5$
b.	$x = \frac{-5}{3}$
c.	$x = -0.1227$
d.	$x = 3$

5.

a.	$p_s = 0.000225x + 0.5925$
b.	$p_d = -0.0009x + 9.39$
c.	supply = demand = 7280 million pounds ; price = \$2.35

6.

a.	12.5 million chips for a maximum revenue of \$468.75 million
b.	2.415 million chips and 17.251 chips
c.	$x \in [1, 2.415) \cup (17.251, 20]$