

**GRADE 12 APPLIED**  
**PRACTICE MID-TERM**  
[May 2018]

Name: \_\_\_\_\_  
Date : \_\_\_\_\_

Round all decimal answers to **2** decimal places. Single page of Reference Notes permitted. Reduce all fractions, etc... (usual)  
Always show work for best marks.

**Time Limit:** 90 minutes

1. **One** ball is drawn at random from a box containing three red marbles, two white marbles, and four blue marbles. Determine, for the separate trial below, the probability using fractions and percentages that the drawn marble is:

a. Blue [ie:  $P(\text{Blue})$ ]

8

b. not Red [ $P(\overline{\text{Red}})$ ]

c. White [ $P(\text{White})$ ]

d. Red or White [ $P(\text{Red} \cup \text{White})$ ]

MrF

2. Determine the probability of throwing a total sum of six in a single throw of two dice. Express solution as fraction and percentage.

2

3. Calculate the probability of throwing a total sum of 8 **or** 11 in a single throw of a pair of normal dice? Express solution as fraction and percentage.

2

4. A drawer contains six blue socks and eight white socks. If two socks are drawn out randomly in the dark and not replaced: (Express solution as fraction and percentage)

a. what is the probability you draw out a blue sock **then** a white sock?

6

b. what is the probability you draw out two blue socks?

c. what is the probability you pull out a matching pair?

MrF

5. How many ways can Joel select his morning breakfast of **eggs, toast** and a **drink** if he has a choice of **eggs**: *scrambled, fried, or poached*; his **toast**: *rye, brown or white*; and his **juice**: *apple or orange or mango*.

2

6. **Mr F Class**

- a. Mr F has **14** students in his class. He needs to take a **group** of **four** students downstairs to set up tables. How many different **groups** could he make?

4

- b. Mr F knows that if he leaves Gabriel behind in the class he will cause mischief, so he plans on taking him to the student lounge for sure in his table crew! How many ways can he form his table set-up crew now?

7. How many different and distinguishable ways can you re-arrange all the letters of the words:

a. **SUITCASES**

b. **YELLOWQUILL**

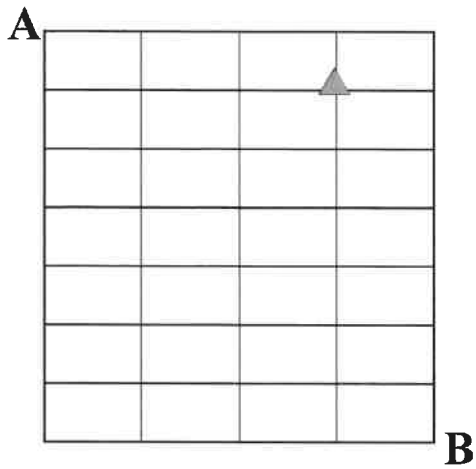
When re-arranging 'YELLOWQUILL', what is the probability that:

- a. A **Y** is the first letter;    b. an **L** is the first letter? (tough one?)



**8. COUNTING PATHWAYS**

- a. How many different paths, *without backtracking*, can a person get from A to B.



- b. How many ways go past the triangle store?

- c. What is the probability that if the person randomly chooses a path to get from A to B that he will walk past the triangle store?

9. The Goldeyes are playing a double header tonight (two games) against Duluth. The probability that the Goldeyes will **win** the first game against Duluth is 70%. **If** the Goldeyes **win** the first game they will be over-confident and there is only a 40% chance they will win the second game. **If** however the Goldeyes **lose** the first game they will pullout all the stops and there is a 85% chance they will win the second game.

a. draw the probability tree.

8
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b. what is the probability the Goldeyes win both games?

c. what is the probability the Goldeyes **lose both** games?

d. What is the probability that the Goldeyes will **win at least one** of the two games they play against Duluth?

MrF

ANSWERS TO

GRADE 12 APPLIED MID TERM PRACTICE

(May 2018)

Hopefully I did not make in mistakes in this answer Key

Figure out your own %! I do not do decimals!!

1.a. $\frac{4}{9}$ b. $\frac{2}{3}$ c. $\frac{2}{9}$ d. $\frac{5}{9}$
2. $\frac{5}{36}$
3. $\frac{7}{36}$
4. a. $\frac{24}{91}$ b. $\frac{15}{91}$ c. 47.35%
5.a. 27 ways
6. a. 1001    b. 286
7. a. 60,480    b. 1,663,200    c. $\frac{1}{11}$ d. IDK!
8. a. 330    b. 28    c. $\frac{7}{110}$
9. Easy tree!    b. 0.28    c. 0.045    d. 0.955
10. Graph
11. $f(x)$ Vertex (2,4); LOS: $x=2$ y-Intercept: (0,-28) x-intercept(s) (4,0);(-7,0) Domain: $-\infty < x < \infty$ Range: $-28 \leq y < \infty$  . $f(x)$ Vertex (-1.5, -30.25); LOS: $x=-1.5$ y-Intercept: (0, 3) x-intercept(s) (-2, 0);( 6, 0) Domain: $-\infty < x < \infty$ Range: $-\infty \leq y \leq 4$

16. When she turned 25, Alexa began investing \$400.00 monthly into a mutual fund account producing average returns of 6.00%, compounded monthly. Alexa will stop contributing when she retires at age 55.

- a) How much money will her investment be worth at retirement?
- b) Alexa will withdraw \$2,500.00 per month from her account after retiring. If the average return rate stays the same, how old will she be when the account balance is zero?

### JUN 2017

17. The Bashir family wants to buy a house. They can afford monthly payments of \$1,325.00. The bank offers them an interest rate of 3.25%, compounded semi-annually over 15 years or 25 years.

- a) Determine the maximum amount they can borrow if the mortgage is amortized over 15 years.
- b) Determine the maximum amount they can borrow if the mortgage is amortized over 25 years.
- c) Give one reason why the Bashir family would choose to buy the less expensive house.

18. You are presented with two different investment plans:

**Plan A:** Invest \$1,000.00 every year for 10 years at an interest rate of 6.00%, compounded monthly.

**Plan B:** Invest a lump sum of \$10,000.00 at an interest rate of 6.00%, compounded monthly for 10 years.

- a) Determine the value of each investment plan after 10 years.
- b) Calculate the total amount of interest earned for each plan.
- c) Which plan would you choose? Explain.

19. The Connors are purchasing a condominium that costs \$190,000.00. They have \$25,000.00 saved for a down payment and will finance the balance at an interest rate of 5.50% for 20 years, compounded semi-annually.

- a) Determine their monthly mortgage payment.
- b) There are condominium fees of \$300.00 per month in addition to the down payment and mortgage payments. Calculate the total amount they will have paid after 5 years.

### JAN 2018

20. Salwa bought a new computer system for \$6,000.00. She anticipates the value of the system to depreciate at a rate of 15% per year. What will the computer system be worth at the end of 3 years?



21. Diego plans to move to Portage la Prairie. He has two housing options:

**Option 1:**

- Buy a house with a monthly mortgage payment of \$1,063.65.
- Property taxes are \$3,070.00 per year.

**Option 2:**

- Rent a house for \$1,250.00 per month.

- a) Determine the total cost of Option 1 at the end of 25 years.
- b) How many years will it take for the total cost of renting to equal the total cost of buying the house? [break even point]
- c) Explain why Diego might choose to buy the house.

22. Donald and Alex have a combined gross monthly income of \$5,500.00. They want to buy a house in a neighbourhood where the average monthly heating cost is \$200.00 and monthly property taxes are \$325.00.

- a) Calculate the maximum monthly mortgage payment they can afford, based on the gross debt service ratio.
- b) Based on the maximum monthly mortgage payment in (a), their bank has offered them a 25-year mortgage at an interest rate of 3.50%, compounded semi-annually. If they have saved \$20,000.00 for a down payment, what would be the maximum house price they can afford?

Jun 2018

23. The table below shows the value of a luxury vehicle over a two-year period.

Year	Value
0	\$58,500
1	\$42,100
2	\$30,300

The value of this vehicle depreciates at an annual rate of:

- A) 72%      B) 52%      C) 39%      D) 28%

24. Johannes wants to apply for a bank loan. Information regarding his financial situation is given below.

- He has a house valued at \$225,000.00 with a mortgage of \$175,000.00.
- He has a cottage valued at \$115,000.00 with a mortgage of \$75,000.00.
- He has \$9,000.00 in his savings account.
- He owes a total of \$25,000.00 on his credit cards.

- a) Calculate his net worth.
- b) Calculate his debt-to-equity ratio.
- c) Based on his debt-to-equity ratio, would the bank lend him money? Explain.

26. Rémi deposited a sum of money into an account 36 years ago that earned an annual interest rate of 8.00%. Today, there is \$12,800.00 in his account.

Use the Rule of 72 to estimate the initial amount that Rémi deposited.  
[Check your result more accurately with a manual calculation and with a App; you always check anyway don't you?]

27. Mr. Smythe makes a one-time donation to a university. The university decides to invest this money and use only the amount earned in simple interest from the investment to finance a scholarship.

- The initial amount of the donation was \$650,000.00.
- The amount earned in simple interest annually is \$40,000.00.
- The university awards the scholarship to one student each year.

At what interest rate must the donation be invested to obtain the \$40,000.00 needed to award the scholarship each year? [in 'perpetuity']

28. Bonnie and Claude want to buy a house. They can afford monthly payments of \$1,125.00. The bank offers them a mortgage at an interest rate of 3.10%, compounded semi-annually, with an amortization period of 25 years.

- a) What is the maximum amount of money the bank will lend them for their mortgage?
- b) If they have \$30,000.00 saved for a down payment, what is the maximum house price they can afford?

29. Bernard is exploring financing options for a new house. The bank offers him a mortgage of \$245,827.00 at an interest rate of 3.75%, compounded semi-annually. He has the following payment options:

**Option 1:** monthly payments of \$1,260.00

**Option 2:** biweekly payments of \$630.00

- a) How many years will it take Bernard to pay off the mortgage with each option?
- b) If Bernard makes biweekly payments instead of monthly payments, how much money will he save?

### JAN 2019

30. Eric wants to borrow money from his bank. Which of the following compounding periods results in the least amount of interest paid on the loan?

- A) monthly
- B) semi-annually
- C) quarterly
- D) daily

31. Jeannette's new job involves a lot of driving. She wants to lease a new vehicle. Her friend Simon is trying to convince her not to lease.

State two reasons that Simon could use to convince her not to lease.

32. Himesh wants to retire in 35 years. After meeting with his financial advisor, he determines that his portfolio will consist of the following two investments:

**Investment 1:** \$15 000.00 in a mutual fund that earns an interest rate of 6.50%, compounded monthly.

**Investment 2:** regular biweekly deposits of \$180.00 in a tax-free savings account (TFSA), with an interest rate of 3.75%, compounded biweekly. (Assume the initial value of the TFSA is 0.)

a) What will be the value of each investment when Himesh retires?

b) Himesh's goal is to have \$500,000.00 in his portfolio by the time he retires. Determine if he will meet his goal. Justify your answer by using your investment values in (a).

b. Yes, the bank will likely offer them a mortgage since the GDSR is below 32%.

10. multiple responses possible:

lower monthly payment • can change vehicle at the end of the lease period  
• do not have to worry about selling the vehicle

11. a. Her payment will be \$460.45

b. The cabin will be valued at \$221 746.20

c. She will have \$166 815.40 in equity after 10 years

12. a. Alfred will have \$288 905.49 at retirement

b. He can make withdrawals for 221 months

c. Marianne can withdraw a maximum of \$1169.18 each month

### JAN 2017

13. **C.** 12 years

14. Option 1: \$35,189.11; Option 2: \$36,474.14. Option 2 allows Imani to purchase a more expensive car

15. Multiple possible answers

16. a. Her investment will be worth \$401,806.02 at retirement

b. She will be 82 years old when the account balance is zero

17. a. The maximum amount is \$188,851.29

b. The maximum amount is \$272,540.68

c. Multiple possible answers. The Bashir family would choose to buy the less expensive house since they would own their house sooner

18. a. The value for Plan A is \$13,285.11 while it is \$18,193.97 for Plan B

b. PLAN A: \$3,285.11 PLAN B: \$8,193.97

19. a. Their monthly mortgage payment will be \$1,129.25

b. They will have paid \$110,755.00

### JAN 2018

20. a. The computer system will be worth \$3,684.75

32. a. The value of Investment 1 will be \$145,025.69. The value of Investment 2 will be \$338,449.99  
b.  $\$145,025.69 + \$338,449.99 = \$483,475.68$ . No, he will not meet his goal.

33. a. Kaia's monthly mortgage payment is \$1,627.23  
b. The value of her house will be \$538,347.34  
c. Kaia will have \$379,585.55 in equity after 15 years

34. a. His debt-to-equity ratio is 55%  
b. His total assets are \$640,000.00.  
c. No, the bank will not lend him the money since his debt-to-equity ratio is above 50%

### JUN 2019

35. a. There are 207,360 different ways  
b. Her monthly payment is \$429.29  
c. The total amount Diane will pay is \$40,060.36

36. B) \$1,220.64

37. Possible answers: No down payment is needed. Mr. Chen would not be responsible for maintenance. If Mr. Chen needed to relocate, he would not need to sell the house.

38. a. She will have \$10,600.78 at the end of the 6-year period  
b. Nadia needs to make a minimum of 7 additional monthly payments

39. a. The maximum monthly mortgage payment they can afford is \$1305.67  
b. The maximum house price they can afford is \$262,622.61

40. a. The value of Amor's TFSA is \$192,789.31 while Angélique's is \$159,259.67  
b. A small long-term investment may earn more interest compared to a large short-term investment.

There are tons more practice problems available for prior years and from other sources. Find them yourself, or ask teacher.