Name: _____ Class: _____ Date: _____ ID: A

Math 12 Foundations: Final Exam Review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Sokka invested $500 for 3 years. At the investment's maturity, its value was $578. What was the annual simple interest rate?

A. 5.2% **B.** 4.4% **C.** 6.2% **D.** 5.8%

____ 2. Determine the interest earned on a 10-year investment with an interest rate of 5.4%, compounded annually, if the future value is $80 000.

A. $32 719.30 **B.** $33 310.31 **C.** $33 605.82 **D.** $32 837.50

____ 3. A 6-year bond has an interest rate of 4.85%, compounded quarterly, and a future value of $70 000. Determine the ratio of future value to present value.

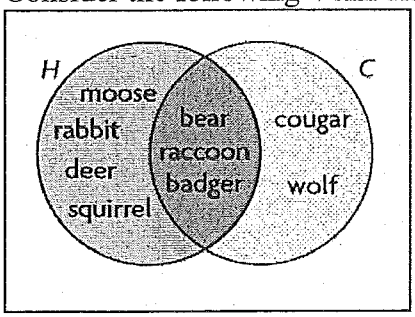
A. 1.335 **B.** 1.263 **C.** 1.438 **D.** 1.294

____ 4. Rahim described the set as follows:
- M = {all of the foods he eats}
- D = {his favourite desserts}
- V = {his favourite vegetables}
- F = {his favourite fruits}

Which are the disjoint sets?

A. M and D **B.** M and V **C.** M and F **D.** V and F

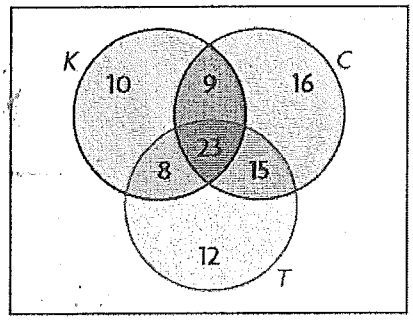
____ 5. Consider the following Venn diagram of herbivores and carnivores:



Determine $H \cap C$.

A. {moose, rabbit, deer, squirrel} **B.** {bear, raccoon, badger} **C.** {cougar, wolf} **D.** {moose, rabbit, deer, squirrel, bear, raccoon, badger, cougar, wolf}

____ **6.** A restaurant offers Chinese, Thai, and Korean food. The following Venn diagram shows the types of food the customers like.



Use the diagram to determine $n(C) - n(T)$.

A. 5 **B.** 4 **C.** 10 **D.** 15

____ **7.** What is a hypothesis?

A. an idea **B.** a statement **C.** a clue **D.** an assumption

____ **8.** Which statement is the contrapositive of the conditional statement below?
"If a balloon is filled with helium, then the balloon will float upwards."

A. If a balloon floats upwards, then the balloon is filled with helium. **B.** If a balloon is not filled with helium, then the balloon will not float upwards. **C.** If a balloon is not filled with helium, then the balloon will float downwards. **D.** If a balloon does not float upwards, then the balloon is not filled with helium.

____ **9.** Evaluate.

$$\frac{4! \cdot 7!}{8!}$$

A. 0 **B.** 1 **C.** 3 **D.** $\frac{1}{3}$

____ **10.** Suppose a word is any string of letters. How many five-letter words can you make from the letters in KELOWNA if you do not repeat any letters in the word?

A. 78 125 **B.** 16 807 **C.** 2520 **D.** 1250

____ **11.** How many numbers are there from 900 to 999 that do not have any repeated digits?

A. 81 **B.** 90 **C.** 100 **D.** 72

____ **12.** Solve for r.

$${}_{15}P_{r-2} = 2730$$

A. $r = 5$ **B.** $r = 6$ **C.** $r = 1$ **D.** $r = 3$

____ 13. How many ways can 8 friends stand in a row for a photograph if Molly, Krysta, and Simone always stand together?

A. 1440 **B.** 4320 **C.** 5040 **D.** 2160

____ 14. How many different arrangements can be made using all the letters in CANADA?

A. 120 **B.** 180 **C.** 360 **D.** 720

____ 15. How many different arrangements can be made using all the letters in CALGARY, if the first letter must be G?

A. 360 **B.** 480 **C.** 120 **D.** 720

____ 16. A fun fair requires 4 employees to work at the sack bar. There are 13 people available. How many ways can a group of 4 be chosen?

A. 1000 **B.** 715 **C.** 635 **D.** 808

____ 17. Identify the term that best describes the following situation:
Determine the number of two-card hands you can be dealt from a standard deck of 52 cards.

A. permutations **B.** combinations **C.** factorial **D.** none of the above

____ 18. How many ways can the 6 starting positions on a hockey team (1 goalie, 2 defense, 3 forwards) be filled from a team of 2 goalies, 4 defense, and 7 forwards?

A. 420 **B.** 500 **C.** 858 **D.** 1716

____ 19. The odds of Macy passing her driver's test on the first try are 7 : 4. Determine the odds against Macy passing her driver's test.

A. 4 : 7 **B.** 4 : 11 **C.** 7 : 11 **D.** 3 : 11

____ 20. From a committee of 18 people, 2 of these people are randomly chosen to be president and secretary. Determine the number of ways in which these 2 people can be chosen for president and secretary.

A. ${}_2P_2$ **B.** ${}_2P_1$ **C.** ${}_{18}P_2$ **D.** ${}_{18}P_{16}$

____ 21. Yvonne tosses three coins. She is calculating the probability that at least one coin will land as heads. Determine the total number of outcomes.

A. 2 **B.** 4 **C.** 8 **D.** 16

____ 22. Dora tosses four coins. Determine the probability that at least two coins will land as heads.

A. 37.52% **B.** 46.30% **C.** 68.75% **D.** 74.17%

____ 23. Josie is about to draw a card at random from a standard deck of 52 playing cards. Determine the probability that she will draw a red card or a 7.

A. $\frac{1}{13}$ **B.** $\frac{1}{2}$ **C.** $\frac{7}{13}$ **D.** $\frac{15}{26}$

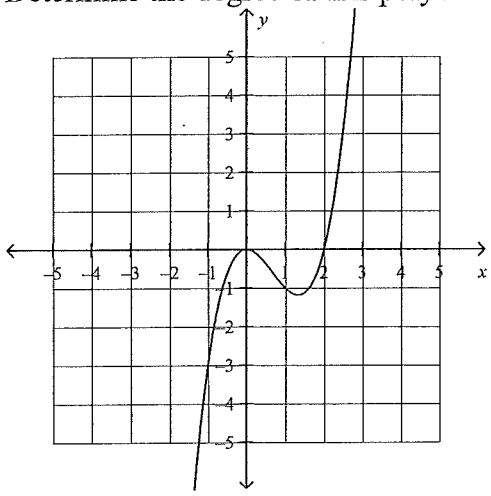
____ 24. Lorne rolls two regular six-sided dice. Determine the odds against him rolling an odd sum or a 4.

A. 7 : 11 **B.** 1 : 8 **C.** 17 : 19 **D.** 5 : 7

____ 25. A five-colour spinner is spun, and a die is rolled. Determine the probability that you spin yellow and roll a 6.

A. 2.42% **B.** 3.33% **C.** 6.13% **D.** 7.75%

____ 26. Determine the degree of this polynomial function:



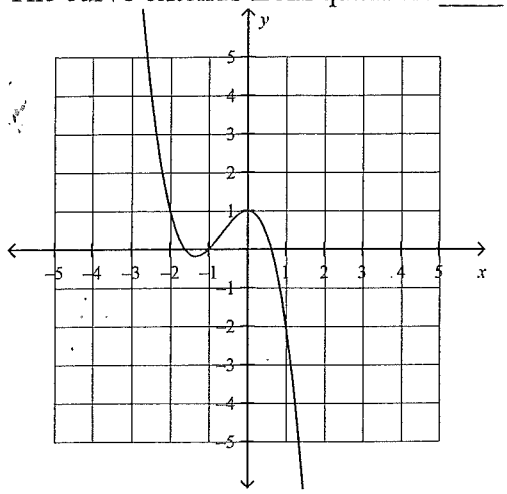
A. 0 **B.** 1 **C.** 2 **D.** 3

____ 27. Determine the leading coefficient of this polynomial function:

$f(x) = \frac{3}{4} + 2x$

A. $\frac{3}{4}$ **B.** 2 **C.** 3 **D.** 4

___ **28.** Fill in the blanks to describe the end behaviour of this polynomial function:
The curve extends from quadrant ____ to quadrant ____.



A. II; I **B.** II; IV **C.** III; I **D.** III; IV

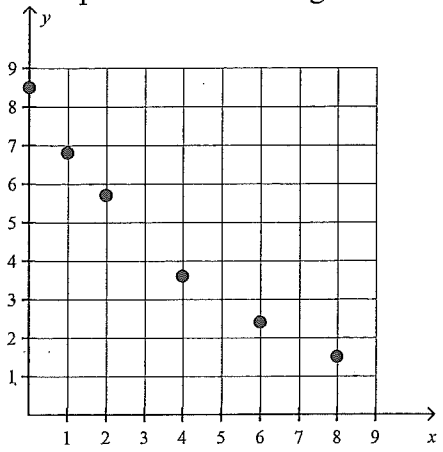
____ **29.** The average retail price of gas in Canada, from 1979 to 2008, can be modelled by the function $P(y) = 0.008y^3 - 0.307y^2 + 4.830y + 25.720$
where P is the price of gas in cents per litre and y is the number of years after 1979.
Determine the average price of gas in 2002.

A. 68.8¢/L **B.** 69.8¢/L **C.** 70.4¢/L **D.** 71.7¢/L

____ **30.** Which option best describes the behaviour of the exponential function $g(x) = \frac{1}{2}(10)^x$?

A. increasing because $a > 1$ **B.** decreasing because $0 < a < 1$ **C.** increasing because $b > 1$
D. decreasing because $0 < b < 1$

____ **31.** A scatter plot is drawn using a data set.



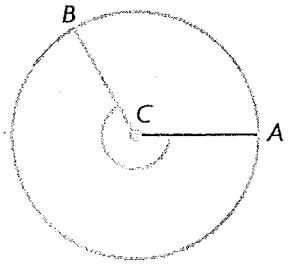
Extrapolate the value of y when $x = 10$.

A. 1.5 **B.** –0.3 **C.** 0.0 **D.** 1.0

____ **32.** The equation of the logarithmic function that models a data set is $y = 8.2 + 0.7 \ln x$. Determine the domain of this function.

A. $\{x \mid x \in \mathrm{R}\}$ **B.** $\{x \mid x > 0, x \in \mathrm{R}\}$ **C.** $\{x \mid x > 0.7, x \in \mathrm{R}\}$ **D.** $\{x \mid x > 8.2, x \in \mathrm{R}\}$

____ **33.** Choose the best estimate for the central angle (labeled C, the angle arc) in radians.

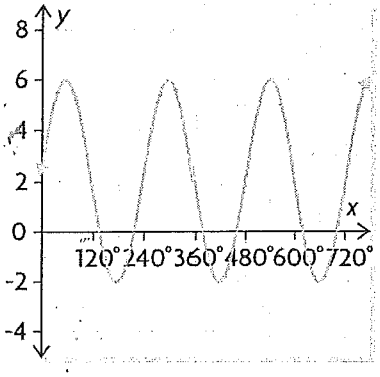


A. 4.2 **B.** 4.8 **C.** 5.2 **D.** 5.8

____ **34.** Imagine that it is now 2 p.m. What time will it be when the minute hand has rotated through 1260°?

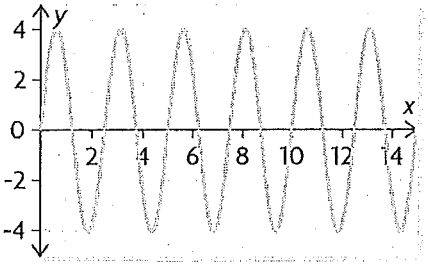
A. 5:30 **B.** 4:50 **C.** 6:00 **D.** 4:10

___ 35. Determine the amplitude of the following graph.



A. 2 **B.** 3 **C.** 4 **D.** 5

___ 36. Determine the range of the following graph.



A. $\{y \mid -8 \le y \le 8, y \in \mathrm{R}\}$ **B.** $\{y \mid -4 \le y \le 4, y \in \mathrm{R}\}$ **C.** $\{y \mid 0 \le y \le 15, y \in \mathrm{R}\}$ **D.** $\{y \mid y \in \mathrm{R}\}$

___ 37. Determine the amplitude of the following function.
$y = 3 \sin 2(x + 90°) - 1$

A. 2 **B.** 3 **C.** 4 **D.** 5

Problem

1. The last question on the Final Exam will be a "write your own question and answer it." It will be worth 4 marks (based on creativity, appropriateness, difficulty level of question and accuracy of answer.)