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

# PreCalc 12 Chapter 8 Review 2017 v1

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

**Easy**

____ **1.** A multiple-choice test has 11 questions. Each question has 3 choices: A, B, or C. How many ways can the test be answered?

**A.** 177 147
**B.** 33
**C.** 1331
**D.** 14

____ **2.** The final score in a recreational soccer game is 6 - 8. How many scores are possible at the end of the first half?

**A.** 48
**B.** 16
**C.** 35
**D.** 63

____ **3.** A video game allows a player to customize the appearance of her avitar. There are 5 hair colours, 2 hairstyles, 8 faces, and 3 outfits to choose from. How many different avitars can be created?

**A.** 18
**B.** 240
**C.** 168
**D.** 56

____ **4.** A doctor is doing her rounds. She has 8 patients to visit. The doctor sees each patient once. How many ways can she make her rounds?

**A.** 362 880
**B.** 7
**C.** 40 320
**D.** 5040

____ **5.** What is the value of $\frac{8!}{2!6!}$?

**A.** 1680
**B.** 28
**C.** 336
**D.** $\frac{2}{3}$

____ **6.** Which of these numbers has the least number of permutations of all its digits?

**A.** 849 647
**B.** 444 454
**C.** 445 864
**D.** 644 484

____ **7.** Which expression can be used to determine the number of permutations of the digits 775555?

**A.** $\frac{6!}{2!}$
**B.** $\frac{6!}{2!4!}$
**C.** $\frac{6!}{4!}$
**D.** 6!

____ **8.** What is the value of the 1st number in row 9 of Pascal's triangle?

**A.** ${}_0C_8$
**B.** ${}_{10}C_2$
**C.** ${}_9C_1$
**D.** ${}_8C_0$

____ **9.** Which row of Pascal's triangle contains the expression ${}_6C_2$?

**A.** row 5
**B.** row 2
**C.** row 6
**D.** row 7

____ **10.** Which expression of the form ${}_nC_r$ is equivalent to $\frac{17!}{(17-13)!13!}$?

**A.** ${}_{18}C_{14}$
**B.** ${}_{17}C_{13}$
**C.** ${}_{16}C_{12}$
**D.** ${}_{13}C_{17}$

**Moderate** (Show work for non-MC)

____ **11.** In a geography class, 8 students are scheduled to give their presentations today. One student has to leave early for an appointment, so he will present first. How many different ways are there to schedule all of today's presentations?

**A.** 362 880
**B.** 40 320
**C.** 7
**D.** 5040

____ **12.** How many 4-digit numbers greater than or equal to 5000 and less than 9000 can be formed with no repetition in their digits?

**A.** 24
**B.** 4000
**C.** 5040
**D.** 2016

____ **13.** A teacher has a bank of 13 different test questions. She wants to choose 6 of them for a test. How many different arrangements of 6 test questions are there?

**A.** 6 227 020 080
**B.** 6 227 020 800
**C.** 5040
**D.** 1 235 520

____ **14.** What is the value of $n$ for the equation ${}_nP_3 = 1320$?

**A.** $n = 1$
**B.** $n = 10$
**C.** $n = 12$
**D.** $n = 440$

____ **15.** Which of these numbers has exactly 120 permutations of its digits?

**A.** 637 425
**B.** 223 647
**C.** 425 262
**D.** 222 222

____ **16.** A coin is tossed 7 times. What is the number of ways the coin can land with 3 heads and 4 tails?

**A.** 6
**B.** 5040
**C.** 144
**D.** 35

____ **17.** A student has 18 different books on her bookshelf. She wants to take 6 of them with her on a train trip. How many selections of 6 books could she make?

**A.** 18 564
**B.** 108
**C.** 13 366 080
**D.** 720

____ **18.** A grocery store sells 17 different flavours of jelly powder. How many selections of 6 different flavours could a customer buy?

**A.** 8 910 720
**B.** 12 376
**C.** 720
**D.** 102

____ **19.** In a children's hockey league, 8 of the 17 teams advance to the playoffs. How many different groups of 8 teams could end up in the playoffs?

**A.** 24 310
**B.** 40 320
**C.** 136
**D.** 980 179 200

____ **20.** There are 14 points on the circumference of a circle. How many lines can be drawn to connect all possible pairs of points?

**A.** 28
**B.** 91
**C.** 182
**D.** 196

____ **21.** What are the first three terms in the expansion of $\left(4x-y\right)^4$?

**A.** $256x^4-64x^3y+16x^2y^2$
**B.** $x^4+4x^3y+6x^2y^2$
**C.** $256x^4+256x^3y+96x^2y^2$
**D.** $256x^4-256x^3y+96x^2y^2$

____ **22.** What are the first three terms in the expansion of $\left(-x^2-2\right)^5$?

**A.** $-x^{10}-2x^8-4x^6$
**B.** $-x^{10}-10x^8-40x^6$
**C.** $-x^5-10x^4-40x^3$
**D.** $x^5+5x^4+10x^3$

____ **23.** What is the 4th term in the expansion of $\left(2x-3y\right)^5$?

**A.** $-108x^2y^3$
**B.** $1620xy^4$
**C.** $810xy^4$
**D.** $-1080x^2y^3$

____ **24.** What is the coefficient of $x^4$ in the expansion of $\left(2x^4+3\right)^6$?

**A.** 2916
**B.** 729
**C.** 3888
**D.** 4374

**Short Answer**

**Moderate** (Show work for non-MC)

**25.** At a bus stop, 8 passengers get on a bus with 3 empty seats. In how many different ways can some of these passengers be seated?

**26.** A student wants to write the word ORGANIZE, using a different colour for each letter. The student has 14 different-coloured markers to choose from. How many different ways can the student use colour to write the word?

**27.** How many 12-digit numbers can be created from the digits 8,8,8,8,5,5,5,5,7,7,7,7?

**28.** A teacher has 4 spider plants, 2 cacti, and 5 geraniums. How many ways can he arrange the types of plants in a row on the window sill?

**29.** Solve this equation for $n$: ${}_n\mathrm{C}_2 = 28$

**30.** A child has 11 different toy cars and 11 different stuffed animals. She wants to take 6 cars and 9 stuffed animals to a friend's house. How many selections could the child make?

**31.** A manager is scheduling an employee for the next two weeks. The employee is to work 5 weekday shifts and 2 Saturday or Sunday shifts. The employee has requested the second Friday off. How many ways can the manager arrange the employee's schedule?

**32.** At a potluck, there are 5 different main dishes and 12 different desserts. Of the 12 desserts, 7 of them are different types of cookies. How many selections of 3 main dishes and 2 desserts could you make without taking any cookies?

**33.** Expand $\left(-2x+3\right)^5$.

**34.** Expand $\left(-5x^3 + 2y^2\right)^5$.

**35.** One term in the expansion of $\left(ab^3 + 1\right)^7$ is $7a\,b^3$. Which other term in the expansion has a coefficient of 7?

**Difficult** (Show work for non-MC)

**36.** One room in an art gallery has space for 3 paintings and 1 sculpture. The gallery has 11 paintings and 5 sculptures to choose from. How many ways can the art be arranged in the room?

**Problem**

**Moderate** (Show work for non-MC)

**37.** A hand of 7 cards is dealt from a standard deck of 52 playing cards. How many hands of 3 hearts and 4 black cards can be dealt?

**38.** Expand $\left(\frac{3}{2}x + \frac{4}{5}y\right)^5$.

**39.** Which binomial power when expanded results in
$32x^5 + 240x^4 + 720x^3 + 1080x^2 + 810x + 243$ ?

**Difficult** (Show work for non-MC)

**40.** Four couples go to see a movie. They sit together in 8 consecutive seats and couples sit together. How many seating arrangements are possible?

**41.** A florist is making a wreath, which will have 9 different flowers arranged around it. How many ways can the flowers be arranged on the wreath?

**42.** How many ways can all the letters in the word RHUBARB be arranged so that the vowels are always together?

**43.** A student club has 29 members, 15 of whom are girls. How many 5-member committees are possible if at least 3 of the members must be girls?

**44.** Use what you know about Pascal's triangle to explain why ${}_{n+1}\mathrm{C}_r = {}_n\mathrm{C}_{r-1} + {}_n\mathrm{C}_r$.