

# PREREQUISITES FOR STATISTICS (MATH2208) AND FINITE MATH (MATH1130)

This pamphlet describes the prerequisites for MATH2208 (Introduction to Probability and Statistics) and MATH1130 (Finite Mathematics) and provides practice questions on the prerequisite topics (a separate pamphlet is available for Precalculus and Calculus).

**Students planning to take MATH 1130 or MATH 2208 no longer have to write a placement test.**

The prerequisite for MATH2208 and MATH1130 is Grade XI or XII academic math or equivalent, or MATH0020 with a grade of at least C, or any 1000-level math course. If you are not sure if you meet the formal prerequisites, but you think you may qualify due to special circumstances, please consult the Mathematics Department.

Since mathematical skills deteriorate over time, students who have been away from mathematics for a while often need to review basic mathematics beforehand in order to succeed in MATH 1130 or MATH 2208. Therefore the questions in this brochure cover the topics that you will be expected to know at the start of the course. It is strongly recommended that you review these questions just before the course begins so you will find it easier to learn the new course material. One major reason why students may have trouble with these courses is that they are weak on the prerequisites. Since mathematics is cumulative, difficulty with arithmetic and basic algebra will cause more difficulty with subsequent courses.

LAST UPDATED APRIL 2002 BY SUZANNE SEAGER

## Prerequisite Topics for MATH1130 (Finite Mathematics) and MATH2208 (Introduction to Probability and Statistics I)

- A. Integer Arithmetic
- B. Exponents and Radicals
- C. Fractions and Decimals
- D. Percentages
- E. Evaluating Algebraic Expressions
- F. Order Relationships
- G. Equations of Lines
- H. Linear Equations in One Variable
- I. Applications of Linear Equations
- J. Systems of Equations in Two Variables

**References:** The booklet "Basic Math Review to Prepare for Statistics and Finite Math", available in the MSVU Bookstore for about \$2, includes a short review and complete solutions to these questions. For more detail, try textbooks with titles like "College Algebra", some of which are in the university library (near QA154). Also for those with valid MSVU student id's, there are books at the MSVU library on 7-day reserve. Ask at the circulation desk, under course MATH 001. These reserve books have specific topic references pasted **inside the front cover**.

### PREREQUISITE PRACTICE QUESTIONS

Note: When asked to evaluate, give an exact answer. When asked to approximate, give an approximation to three decimal places.

#### A. Integer Arithmetic

- 1) Evaluate a)  $4 + 3 \times 7 - 8 \div 2$  b)  $(-3)5 - 2(4 + -7)$
- 2) Evaluate a)  $(-3)(-7)+6(-2)-(-8)5$  b)  $(-2)[(-2)(-2)(-2) - 2]$

#### B. Exponents and Radicals

- 3) Evaluate a)  $6^2$  b)  $17^2$  c)  $2^3$  d)  $(-4)^2$  e)  $-3^4$  f)  $(-5)^3$  g)  $9^{1/2}$
- 4) Evaluate a)  $\sqrt{81}$  b)  $-\sqrt{225}$  c)  $\sqrt{-49}$  d)  $\sqrt{(25-9)}$  e)  $\sqrt{25}-\sqrt{9}$

#### C. Fractions and Decimals

- 5) Evaluate a)  $1/4 + 3/8$  b)  $3/5 - 1/3$  c)  $3/10 + 5/6$  d)  $5/8 - 3/4$
- 6) Evaluate a)  $3/4 \times 1/6$  b)  $25/3 \times 7/10$  c)  $1/2 \div 3/4$  d)  $5/6 \div 21/3$
- 7) Evaluate a)  $(1/2)(2/3) + (5/6)(2/5)$  b)  $(1/4)(3 - 3/5)$
- 8) Approximate a)  $5.7^2 - 3.7^2$  b)  $\sqrt{(2^2 + 3^2 + 4^2)}$  c)  $(\sqrt{4.9} - \sqrt{2.5})^2$
- 9) An urn contains 42 red balls, 12 blue balls, and 21 green balls. What proportion of the balls in the urn are red?

#### D. Percentages

- 10) Express as a percentage a) 0.25 b) 0.002 c)  $28/35$  d) 5.4
- 11) Express as a decimal a) 99% b) 3.7% c) 150% d)  $\frac{1}{2}\%$
- 12) Evaluate a) 35% of 40 b) 0.8% of 500 c) 25 increased by 40%
- 13) A class has 24 women and 8 men. What percentage are men?
- 14) A stock selling at \$40 on Monday morning went down by 5% on Monday, then went up by 10% on Tuesday. How much was it worth at the end of Tuesday?
- 15) If 3 students form 15% of a class, how large is the class?
- 16) A table costs \$89 and a matching chair costs \$49. A set of one table with four chairs is sold at 20% off when bought together. How much is the set?

#### E. Evaluating Algebraic Expressions

- 17) Evaluate  $4x^2y - 3xy^2$  for a)  $x = -2, y = 3$  b)  $x = -1, y = -2$
- 18) Approximate  $\sqrt{p(1-p)}$  for a)  $p = 0.5$  b)  $p = 0.01$
- 19) Approximate  $x - z^*(\sigma/\sqrt{n})$  for  $x = 0.57, \sigma = 0.043, n = 5$  and  $z^* = 1.645$
- 20) Given  $\Pr(E \cup F) = \Pr(E) + \Pr(F) - \Pr(E \cap F)$ , evaluate  $\Pr(E \cup F)$  when  $\Pr(E) = 1/4, \Pr(F) = 3/13$  and  $\Pr(E \cap F) = 3/52$   
(Note: You do NOT need to know what  $\Pr, \cup$  or  $\cap$  mean).
- 21) Given  $s = 6, s_1 = 5, s_2 = 1, s_3 = 7$ , and  $b = 3$ , evaluate  $s + b - s_b + (s_1 + s_2 + s_3)^2$
- 22) Given  $n = 3, x_1 = 5, x_2 = -4, x_3 = 8, x = 3, s \geq 0$ , and  $s^2 = [(x_1 - x)^2 + (x_2 - x)^2 + (x_3 - x)^2] / (n - 1)$ , approximate  $s$ .

#### F. Order Relationships

- 23) Express in symbols a)  $r$  is less than 0.01 and greater than -0.03 b)  $x^2$  is at most 30
- 24) The **median** of a list is the number in the middle when the list is ordered. Find the median of a) 8 -3 7 -11 5 b) -1 -2 -3 4 5 c) 2 2 1 2 -2 -2 0
- 25) Evaluate a)  $|12|$  b)  $|-56|$  c)  $|-7| + |6-8| - |5+4|$
- 26) Aville is 20 km due west of Btown, and Cview is 50 km due west of Btown. How far is Aville from Cview?
- 27) Tom is 2 cm taller than Dick, Dick is 5 cm shorter than Harry, and Sally is 1 cm shorter than Tom. How much taller is Harry than Sally?

#### G. Equations of Lines

- 28) Graph the linear equation  $y = -2x + 8$ .
- 29) Graph the linear equation  $4x - 5y = 10$ .
- 30) Find the slope of the line through  $(-5, 2)$  and  $(6, -1)$ .
- 31) Give the equation in standard form  $ax + by = c$  of the line through the points  $(2, -1)$  and  $(4, 6)$ .
- 32) Give the equation in slope-intercept form  $y = mx + b$  of the line with slope 7 passing through the point  $(4, 3)$ .
- 33) Give the equation in standard form  $ax + by = c$  of the line with

slope  $-5/6$  and y-intercept 4.

- 34) Give the equation in slope-intercept form  $y = mx + b$  of the line through the points  $(1, 5)$  and  $(1/2, 0)$ .

- 35) For  $2x + 3y = 12$ , find  $y$  when  $x$  is a) 2 b) -3 c) 12 d)  $3/4$

#### H. Linear Equations in One Variable

- 36) Solve exactly a)  $5x - 7 = 8$  b)  $4 - x = 9$  c)  $3x + 5 = 7x - 1$   
d)  $4(3x + 5) = -5(x + 13)$  e)  $0.07x + 0.09(x + 200) = 66$
- 37) Solve to three decimal places a)  $23x + 132 = 288$  b)  $1.2 - 0.49x = 3$

#### I. Applications of Linear Equations

- 38) Jo has 23 coins. She has twice as many nickels as pennies and three more dimes than pennies. How many of each type of coin does she have?
- 39) The width of a rectangle is two cm more than one quarter of its length. The perimeter is 34 cms. Find the dimensions.
- 40) The average age of the nine students in a class is 25 years. A new student, who is 35 years old, joins the class. What is the average age now?

#### J. Systems of Equations in Two Variables

- 41) Solve by graphing:  
 $x - y = 8$   
 $3x + 2y = 9$
- 42) Solve by elimination:  
 $5x + 3y = 10$   
 $6x + 4y = 15$
- 43) Solve by substitution:  
 $6x - y = 9$   
 $y = 3x - 7$
- 44) Alice spent 6 minutes on each factoring problem and 3 minutes on each evaluation problem. She spent a total of 42 minutes on 9 problems. How much time did she spend on factoring?
- 45) Cornbowl Cereal contains 30 g. of sugar and 6 g. of fibre per unit, while Ricedish Cereal contains 40 g. of sugar and 2 g. of fibre. How many units of each cereal must be combined to get a mixture containing 445 g. of sugar and 47 g. of fibre?

### Answers to Prerequisite Practice Questions

(Complete solutions can be found in the booklet "Basic Math Review"; see References above)

- 1a) 21 b) -9 2a) 49 b) 20 3a) 36 b) 289 c) 8 d) 16 e) -81  
f) -125 g) 3 4a) 9 b) -15 c) not real d) 4 e) 2 5a) 5/8  
b) 4/15 c) 17/15 or 1 2/15 d) -1/8 6a) 1/8 b) 35/6 or 5 5/6  
c) 2/3 d) 5/42 7a) 2/3 b) 3/5 8a) 18.800 b) 5.385 c) 0.400  
9) 14/25 or 0.56 10a) 25% b) 0.2% c) 80% d) 540% 11a) 0.99  
b) 0.037 c) 1.5 d) 0.005 12a) 14 b) 4 c) 35 13) 25%  
14) \$41.80 15) 20 students 16) \$228 17a) 102 b) 4 18a) 0.5  
b) 0.099 19) 0.538 20) 11/26 21) 171 22) 6.245  
23a)  $-0.03 < r < 0.01$  b)  $\chi^2 \leq 30$  24a) 5 b) -1 c) 1 25a) 12  
b) 56 c) 0 26) 30 km 27) 4 cm 28) Straight line with  
intercepts at (0,8) and (4,0) 29) Straight line with intercepts  
at (0,-2)  
(2 1/2, 0) 30) -3/11 31)  $7x-2y=16$  32)  $y=7x-25$  33)  $5x+6y=24$   
34)  $y=10x-5$  35a) 8/3 or 2 2/3 b) 6 c) -4 d) 7/2 or 3 1/2  
36a) 3 b) -5 c) 3/2 or 1 1/2 d) -5 e) 300 37a) 6.783  
b) -3.673 38) 5 pennies, 10 nickels, 8 dimes 39) 12cm x 5 cm  
40) 26 years 41) (5,-3) 42) (-5/2,15/2) or (-2.5,7.5)  
43) (2/3,-5) 44) 30 minutes (5 problems)  
45) 5.5 units Cornbowl, 7 units Ricedish