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Nursing Math (Quick Study: Academic)

Nursing MATH

Complete essentials for the student or professional: math basics, measurement conversions, dosage calculations, vital signs, body-related calculations, health care operating indicators, condition-specific calculations & calculating risk

BASICS

Positive & Negative Numbers

- Positive numbers are greater than 0 (to the right of 0 on a number line) and get larger as they move further away from 0; they may be written with or without a + sign: $8, 1, 0, -1$
- Negative numbers are less than 0 (to the left of 0 on a number line) and get smaller as you move further away from 0; they must be written with a - sign: $(-8, -1)$

RULES FOR ADDITION

- The sum of two positive numbers is a positive number:
 $100 + 4 = 104$
- The sum of two negative numbers is a negative number:
 $100 + (-4) = 96$
- The sum of one positive number and one negative number may be positive or negative, depending on which is larger, but remember that adding a negative number is the same as subtracting that number:
 $100 + (-2) = 98, -9 - 2 = -7, -10 + 2 = -8, -7 - 7 = -14$

RULES FOR SUBTRACTION

- There are two options as addition of the opposite: a. Just change the subtraction sign to an addition sign, and write the opposite of the original number being subtracted and solve as addition:
 $100 - 2 = 100 + (-2) = 98, -5 - (-2) = 5 + 2 = 7$

RULES FOR MULTIPLICATION

- The product of two positive numbers is a positive number:
 $100 \times 6 = 600$
- The product of two negative numbers is a positive number:
 $100 \times (-6) = -600$
- The product of one positive number and one negative number is a negative number:
 $100 \times (-6) = -600$

RULES FOR DIVISION

- The quotient of two positive numbers is a positive number:
 $100 \div 3 = 33 \frac{1}{3}$
- The quotient of two negative numbers is a positive number:
 $100 \div (-3) = -33 \frac{1}{3}$
- The quotient of one positive number and one negative number is a negative number:
 $100 \div (-3) = -33 \frac{1}{3}, -100 \div 3 = -33 \frac{1}{3}, -100 \div (-3) = 33 \frac{1}{3}$

DISTRIBUTIVE PROPERTY

- A rule used in mathematics states that $a(b + c) = ab + ac$, or that $a(bh - d) = abh - ad$; in other words, the first term inside the parentheses must be distributed to, or multiplied by, each term inside the parentheses
- Use this rule when the goal is for multiplying, negative and positive fractions if negative numbers are involved in the expression:
 $100 \times (5r - 2) = 500r - 200, -100 \times (r + 7) = -100r - 700$

Fractions

- Fractions represent parts of a whole; they are another way of showing division
- The top number is called the numerator, and the bottom number is called the denominator
- Three types of fractions:
 - Proper fractions: The numerator is less than the denominator: $\frac{2}{3}$
 - Improper fractions: The numerator is greater than or equal to the denominator: $\frac{5}{3}$
 - Mixed numbers: Consists of whole numbers and a fraction part: $1\frac{1}{3}$

Lowest Terms: Putting a fraction in a form as that the only common factor between the numerator and denominator is 1 (also called reducing a fraction or writing it in reduced form):

- $100 \times \frac{5}{4}$: The numerator and denominator have a common factor of 2, so divide each by 2 to put it in lowest terms: $\frac{5}{2}$, since there only common factor is 1, so this is lowest terms

NOTE: Fractions that have the same ratio as one another and that same fraction in lowest terms are called equivalent fractions

FINDING THE LEAST COMMON DENOMINATOR (LCD)

- The LCD is the smallest number that all fractions in a series of fractions will divide evenly, this is useful for performing operations (especially addition) with fractions
- Ex: Given the fractions $\frac{1}{3}$ and $\frac{1}{4}$, we find the LCD
- This is about the smallest number that's divisible by both 3 and 4; in this case, 12 is 3×4 , or 2×2 , so we multiply each of the numerators and denominators by whatever is needed to make each denominator equal to 12:
 $\frac{1}{3} \times \frac{4}{4} = \frac{4}{12}$ and $\frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$. The LCD is 12 .

ADDING FRACTIONS

- If the fractions have the same denominator:
 - Add the numerators, the denominator stays the same
 - Write the fraction in reduced form, if necessary
- $Ex: \frac{1}{3} + \frac{2}{3} = \frac{1+2}{3} = \frac{3}{3}$, since the numerator and denominator can both divide by 3, reduce the fraction: $\frac{3}{3} = 1$
- If the fractions have different denominators:
 - Find the LCD and write equivalent fractions for each fraction using the LCD
 - Add the numerators, the denominator stays the same
 - Write the fraction in reduced form, if necessary
- $Ex: \frac{1}{3} + \frac{2}{4} = \frac{1}{3} \times \frac{4}{4} + \frac{2}{4} \times \frac{3}{3} = \frac{2}{4} + \frac{6}{12}$, then add the numerators: $\frac{2+6}{4} = \frac{8}{12}$, then it can be reduced by dividing by a shared number: $\frac{8}{12} = \frac{2}{3}$

SUBTRACTING FRACTIONS

- If the fractions have the same denominator:
 - Subtract the numerators, the denominator stays the same
 - Write the fraction in reduced form, if necessary
- $Ex: \frac{1}{3} - \frac{1}{3} = \frac{1-1}{3} = 0$; since the greatest common factor of the numerator and denominator is 1, the fraction is already in reduced form
- If the fractions have different denominators:
 - Find the LCD and write equivalent fractions for each fraction using the LCD
 - Subtract the numerators, the denominator stays the same
 - Write the fraction in reduced form, if necessary
- $Ex: \frac{1}{3} - \frac{2}{4} = \frac{1}{3} \times \frac{4}{4} - \frac{2}{4} \times \frac{3}{3} = \frac{2}{12} - \frac{6}{12}$, then subtract the numerators: $\frac{2-6}{12} = \frac{-4}{12}$, then it can be reduced by dividing by a shared number: $\frac{-4}{12} = \frac{-1}{3}$, the fraction is already in reduced form

MULTIPLYING FRACTIONS

- Write of variables first, whole numbers or mixed numbers in fraction form
- Multiply the numerators, then multiply the denominators
- Write the results in fraction form, then write the fraction in reduced form
- $Ex: \frac{1}{3} \times \frac{2}{4} = \frac{1}{3} \times \frac{2}{4}$; first, write of numbers in fraction form: $\frac{1}{3} \times \frac{2}{4}$; then multiply the numerators: $1 \times 2 = 2$ and the denominators: $3 \times 4 = 12$; then multiply the denominators: $4 \times 3 = 12$; then write the fraction: $\frac{2}{12}$, and finally reduce: each number is divisible by 4, divide each by 4: $\frac{2}{12} = \frac{1}{6}$

DIVIDING FRACTIONS

- Write all numbers first, whole numbers or mixed numbers in fraction form
- Change the division sign to a multiplication sign
- Write the reciprocal of the second fraction (reciprocal is found by inverting the fraction), so that the numerator is on the bottom and the denominator is on the top
- Multiply the numerators, then multiply the denominators
- Write the results in fraction form, then write the fraction in reduced form
- $Ex: \frac{1}{3} \div \frac{1}{4} = \frac{1}{3} \times \frac{4}{1}$; the numbers are both already in fraction form, so change the division sign to a multiplication sign and write the reciprocal of the second fraction: $\frac{1}{3} \times \frac{4}{1}$; then multiply the numerators: $1 \times 4 = 4$; then multiply the denominators: $3 \times 1 = 3$; then write the results in fraction form: $\frac{4}{3}$, or a mixed number: $1\frac{1}{3}$

CONVERTING FRACTIONS TO DECIMALS

- Write the fraction first, whole numbers or mixed numbers in fraction form
- Divide the numerator by the denominator, and add a zero to the right of the decimal point, if necessary
- $Ex: \frac{1}{3} = 0.\overline{3}$ (as it is a mixed number, write it as a fraction first: $\frac{1}{3}$, then divide 13 by 3 to get 1.3, since there's already a decimal to the left of the decimal point, there is no need to write the zero-in-front of it)

CONVERTING FRACTIONS TO PERCENTAGES

- Convert the fraction to a decimal (as explained above)
- Round the decimal to the nearest thousandth
- Multiply by 100 and add the percent sign (%)
- $Ex: \frac{5}{8}$ is already in fraction form, we just divide 5 by 8 to get 0.625; then multiply by 100 to get the percent (62.5), then multiply by 100 and add the percent sign (%)

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Synopsis

BarCharts™ newest 3-panel guide takes the mystery out of the different forms of math that are crucial to the nursing field. Each page is jam-packed with mathematical equations and formulas, their definitions, and step-by-step instructions on how to perform each one; helpful charts and tables are also included. Nursing students/practitioners + this guide = great success!

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Customer Reviews

It was useful briefly. I stuck it in front of one of my binders and referred back to it a few times when I was starting out. Good for beginners or someone that likes to have information laid out like this and easily accessible.

In addition to the must have Elsevier HESI Exam Review book, I bought QuickStudy as another tool guide. I like that the information is concise, which makes it short and sweet. The information you need to know for the mathematic section for the HESI exam is very basic. Students have been taught the necessary math material, as early in elementary school to the end of sophomore year in high school. Nice to have on hand, but it is not necessary to purchase. All of the information for the math section is covered in the Elsevier review book. I recommend this product. Perfect note format, which will come in handy.

I bought many of these cards (in different subjects) from and they were a GREAT help in nursing school and now as a Nurse I find I refer to them all the time. Recommend highly!

Very helpful, wish I would have found this earlier to have more time to study for my entrance test sooner.

Excellent reference, not only for nursing students but professionals like myself that have been nursing for a while.

Thanks again. Items got to me on-time You are great at meeting expectations. Keep up the good work. Great job!

this is really helping me with my medication calculations. Love it. Hope it helps me with passing my final.

Man was this delivered quickly. The item is even better than we had imagined....thank you!

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