2017 **SAMPLE** MATH PROBLEMS

DIRECTIONS: The following is true of these problems and will also be true of the problems students competing in the 2017 Pennsylvania State FFA Vet Skills Competition will see:

1. The test will consist of the following types of problems:
   1. Percentage
   2. Fraction
   3. Decimal
   4. Ratio
   5. Concentrations
   6. Dosage Calculations with 3 or less steps
2. Each question will be multiple choice, offering 4 answer options.
3. ON THE TEST DURING THE CONTEST the following questions will be 5 points:
   1. Percentage
   2. Fraction
   3. Decimal
   4. Ratio
   5. Concentrations
4. ON THE TEST DURING THE CONTEST dosage calculations will be worth between 5 and 20 points depending on their difficulty.
5. Students are expected to also be able to read a label and/or syringe for the math portion and those problems will also be worth between 5 and 20 points.
6. ON THE TEST DURING THE CONTEST the point value for each question will be identified.
7. This bank of sample questions offers at least one of each problem and gives an EXAMPLE of how many points that type of problem will be worth. The answers are included on the last page. If you require further assistance please contact the PA FFA Vet Skills Committee Chair or a committee member.
8. The Math portion of the Vet Skills Contest is 100 points. This will be made up of a variety of the type of questions explained above.

RESOURCES:

Cornell Veterinary Science Curriculum – See POSOLOGY (available in PDF online)

Other resources are available on the National FFA Website [www.ffa.org](http://www.ffa.org)

FRACTIONS

1. A vet tech gives a dog ½ ounce (oz) of cough medicine at 6 PM and ¾ oz of cough medicine at 10 PM. What is the total amount of cough medicine received?
2. A racehorse trainer is asked to gradually increase a horses’ workouts over a week. During the course of the week how many total miles did the horse run using the following schedule?

|  |  |
| --- | --- |
| Sun | ¼ mile |
| Mon | 1/3 mile |
| Tues | 5/8 mile |
| Wed | 9/12 mile |
| Thurs | ¾ mile |
| Fri | 7/8 mile |
| Sat | 1 mile |

1. A microbiologist notes that the average length of a bacterium is 1/1000 micrometer (mcm). Viruses range in size from 1/2500 to 1500 mcm. How much longer is a bacterium than the smallest virus in mcm?
2. A vet tech weighs a 500mg capsule of Ampicillin and finds it weighs 3/20 of an ounce. Assuming half the amount weighs half as much, how much would 50 capsules containing 250mg weigh?

DECIMALS

1. A racehorse owner with a sick horse receives a vet bill that lists the following charges: farm call - $51.50, blood test - $37.75, urinalysis - $18.25, and medication- $63.95. Calculate the total amount due to the vet.

1. An animal caretaker at the Buffalo Zoo checks his pay stub to note the deductions taken out of his gross pay. If his weekly gross pay is $489.90 and the deductions are: federal tax- $92.13, state tax- $32.69, FICA- $22.15, and city tax - $4.43, how much will he take home this week?
2. A milker makes $465 a week and 7.65% of the total is taken for social security. How much money is paid in social security?

1. A herpetologist in a zoo works 189.25 hours in 23 days. If he works the same number of hours each day, how many hours does he work per day?

1. An accountant is calculating the pay roll. Six receptionists earn $7.25 per hour, four vet assistants earn $6.95 per hour, eight vet techs earn $11.46 per hour, a senior tech earns $14.94 per hour, and four vets earn $25.50, $28.75, $34.95 and $42.10 per hour respectively. If they each work 40-hour weeks, what is the total payroll for one week?

PERCENT & AVERAGES

1. A dog’s body contains 208 bones. If the phalanges represent 56 of these bones, what percentage of all the bones are phalanges?
2. The total cost for a heartworm test is $21. If the laboratory adds 8% for profit to this cost and the veterinarian adds another 10% for his profit, what does the client pay for the blood test? (round to the nearest dollar).

1. The FICA deduction on gross pay includes payment for Social Security and Medicare. The deduction for Social Security is 6.2% of earnings up to a maximum of $60,600.00. The deduction for Medicare is 1.45% of all earnings. If the gross wages for a year are $88,946.56, what is the total amount deducted for FICA?

1. A secretary checks the electric bills for the clinic for a 6-month period. The bills are $178.34, &165.97, $192.91, $183.26, $175.44, and $168.75. To prepare an annual budget for the clinic, what amount should she use for an average yearly electrical cost?

1. A veterinary student in a parasitology course has taken two tests with grades of 87% and 92%, each worth 25% of his final grade. He still has to take the final exam, which is 50% of his grade. What grade must he get on the final to receive a 93% final grade?

LIQUID MEASUREMENT

1. Quantricide is prepared by adding 2 oz to one gallon of water. How much Quantricide would be used to prepare 1 qt of solution?

1. A tech determines that she has 1 gallon of Oatmeal shampoo, 2 quarts of flea shampoo, and 12 cups of Green Apple conditioner. What is the total amount of shampoo and conditioner in pints?

1. Nolvason solution is prepared by adding 1 oz per gallon of water. If a mop pail holds 40 quarts of water and you want to fill it, how much Nolvason should be used to get the proper dilution?

1. To perform a Gram’s stain a technician uses 5 mL of gentian violet, 8 mL of Gram’s iodine. 1.4 cl of acetone-alcohol, 1 cl of safranin and 0.05 L of distilled water per slide. How many total liters of solution does she need for 150 slides?

1. A calf raiser is feeding 10 calves 2 quarts of fresh milk each. How many liters of milk do the ten calves drink in four days if they are fed two times a day?

WEIGHT

1. A German Shepherd weighs 56.8 lb. How much does it weigh in kg?

1. A snake at the Dallas zoo weighs 14.6 kg. How much does it weigh in lb?

RATIO

1. If a 0.5 liter solution of bichloride contains 1 gram of bichloride, then 250 mL will contain how many grams of bichloride?

1. When a bottle of milk replacer is made we add 1 cup of powdered milk to a 12qt bottle. What is the ratio of ounces powder to quarts of water?

1. A salt solution is made by dissolving 9g of salt in 1 L of water. How much salt should be added to 350 mL of water?

DOSAGES

1. Tablets come in 0.25 g and you must administer 1000 mg. How many tablets do you give?
2. You administer 750 mg of medicine that is available as 0.25 g per capsule. How many capsules do you give?

1. You must give 750 mg of medication and the tablets are 1.0 g. How many tablets will you give to the client so that they have enough for one treatment a day (OD) for ten days?

1. The vet orders 60 mg of Gentamicin Sulfate to be given for three days. It is available in a concentration of 80 mg/2 mL. How many cc total will be injected?

1. The veterinarian prescribes penicillin G procaine for a 25 lb dog to be given at a dosage of 40,000 units (U)/kg. The drug concentration is 300,000 U/mL. How many mL will be administered?
2. A dog develops a hot spot and the veterinarian feels the best way to treat it is to use Prednisone (a steroid). Tablets contain 5 mg/tablet. The dog weighs 75 lbs and the recommended dosage is 5mg/25 lbs. How many tablets will be given over five days if the medication is to be given OD?

1. A cat has developed a severe abscess on its jaw and the veterinarian prescribes Antirobe Aquadrops to be given orally as treatment. The dosage is 20mg/kg/day and the drops you have are equivalent to 25mg/mL. The cat weighs 8.8 lbs. How many mL should the cat receive each day?
2. A pig weighs 230 lbs. It cut its leg and the vet recommends giving it Penicillin G twice a day for three days. If the dosage is 3 cc/100 lbs, what is the total amount of Penicillin given?
3. The normal dosage for injectable amoxicillin is 5mg/kg. A dog weighs 88 lbs. How many mg should be given for one treatment?
4. The veterinarian prescribes aminophylline to be given three times per day for 14 days to a 15 lb dog. If the dosage is 10 mg/kg, how may mg does the dog receive for one day?