ANSWER KEY

Dr. George Tietbaum is a rural practitioner in Sagebrush County, NM. As the only vet in the county, Dr. Tietbaum is a mixed animal vet meaning he sees a wide range of species. He operates a clinic and a mobile unit. He is a very busy man, and has decided to hire someone to help him in his practice. Congratulations, you got the job!

One Monday morning as you are cleaning kennels you hear Dr. Tielbaum's phone ring and after a few minutes he appears at the door and tells you to drop the mop and hurry to the vet truck. As you pull out he tells you that you are on the way to the Wagoner place. Mr. Wagoner raises Friesan horses, and this morning a young mare is suffering with a severe bout of colic.

At the farm you discover Mr. Wagoner walking the mare around. She is sweating and in obvious pain. Dr. Wagoner grabs his stethoscope and intercepts Mr. Wagoner who holds the mare still while the doc starts his exam. He puts his stethoscope behind the mares left elbow and after 15 seconds he tells you he counted 19 heartbeats.

1. What is the mare's heart rate?
   A) 15 bpm
   B) 76 bpm
   C) 100 bpm
   D) 255 bpm

$$\frac{19 \text{ beats}}{15 \text{ seconds}} \times \frac{60 \text{ seconds}}{\text{minute}} = \frac{76 \text{ beats}}{\text{minute}}$$

As Dr. Tietbaum comes back to the rear of the horse he inserts his thermometer then applies his stethoscope to the mare's flank on each side covering four quadrants to listen for gut sounds. He lets you listen and you hear faint gurgles in each quadrant. Doc tells you that he is relieved to hear some sounds, but the mare is obviously in pain as evidenced by the increased heart rate and sweat. He asks Mr. Wagoner if he knows how much the mare weighs. Mr. Wagoner tells Dr. Tietbaum that he weighed the mare just two days ago and she weighed 850 pounds.

2. What is the mare's weight in kilograms?
   A) 386 kg
   B) 425 kg
   C) 1700 kg
   D) 1870 kg

$$850 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} = 386 \text{ kg}$$

You pull the thermometer and read a temperature of 37.8 degrees Celsius. The doctor says that is normal and he does not think the mare's colic is due to an infectious cause. From the mare's head Mr. Wagoner comments that he never has understood the Celsius scale and wants to know what the mare's temperature is in Fahrenheit.

3. What is the mare's temperature in degrees Fahrenheit?
   A) 96 degrees
   B) 98 degrees

C) 100 degrees

D) 102 degrees

Fahrenheit = (Celsius x 1.8) + 32 so Fahrenheit = (37.8 x 1.8) + 32 which is 68.04 + 32 = 100.04

Mr. Wagoner mentions that he is very concerned that the mare is still in pain even though he had given her a shot to take the pain away. Dr. Tietbaum asks the horseman what treatment he had tried. Mr. Wagoner says that his neighbor gave him some Banamine in a syringe and told him to inject the entire 2 ml in the muscle. Banamine is a prescription drug that should only be used under the direction of a veterinarian. The concentration of Banamine is 50 mg/ml and is dosed at 1.1 mg/kg IV, IM or SC.

4. How much Banamine did Mr. Wagoner inject into the mare?

A) 2.2 mg

B) 22 mg

C) 10 mg

D) 100 mg

2 ml x 50 mg = 100 mg
         ml

5. What is the correct dose of Banamine in ml for this mare?

A) 1.5 ml

B)   5.5 ml

C) 8.5 ml

D) 10 ml

Wt. in kg = 386 kg	386 kg x 1.1 mg / kg = 424.6 mg	424.6 mg x 1 ml / 50 mg = 8.5 ml

850 lb x 1 kg x 1.1 mg x 1 ml   = 8.5 ml
          2.2 lb   1 kg   50 mg

At this point Dr. Tietbaum explains to Mr. Wagoner that he won't be able to use Banamine on the mare since he cannot be sure how much she got. At any rate Dr. Tietbaum wants to sedate the horse, to give this mare some relief and help her settle down to continue the exam with palpation. Dr. Tietbaum uses Butorphanol (Torbugesic) in these cases because it sedates the horse and relieves the pain. The concentration of Torbugesic is 10 mg/ml, and is dosed at 0.02 mg/kg IV.

6. How much Torbugesic will Dr. Tietbaum inject?

A) 0.7 ml

B) 1.0 ml

C) 7 ml

D) 10 ml

850 lb x 1 kg x 0.02 mg x 1 ml = 0.7 ml
          2.2 lb   1 kg   10 mg

Wt. in kg = 386 kg	386 kg x 0.02 mg / kg = 7.72 mg	7.72 mg x 1 ml / 10 mg = 0.7 ml

As Dr. Tietbaum finishes the injection Mr. Wagoner's daughter Molly runs up with her dog Shep, a 60 pound mixed breed. The vet had seen Shep at the clinic just yesterday to remove porcupine quills from the dog's nose. Dr. Tietbaum had prescribed Clavamox tablets to clear up the infection that had started. Molly reports that the medicine had been ruined when the bottle fell out of her pocket and got ran over in the yard. Doc smiles and tells her not to worry he has some on the truck and will prepare a new bottle while he waits for the mare to get drowsy enough to allow palpation. Clavamox is dosed at 13.75 mg/kg bid. It is available in 62.5 mg, 125 mg, 250 mg, or 375 mg tablets.

7. What tablet size is most appropriate for Shep?
   A) 62.5 mg
   B) 125 mg
   C) 250 mg
   D) 375 mg

Determine Sheps weight in kg, then calculate the dose he requires.

60 lb x 1 kg x 13.75 mg = 375 mg 2.2 lb 1 kg	60 lb x 1 kg = 27.27 kg 2.2 lb	27.27 kg x 13.75 mg = 375 mg 1 kg

Dr. Tietbaum wants Shep to be on the antibiotic for 7 days.

8. How many tabs will be needed?
   A) 7
   B) 10
   C) 14
   D) 21

BID means twice a day and so Shep will need 2 tabs per day.

7 days x 2 tabs = 14 tabs
         day

Dr. Tietbaum gives Molly the medicine for Shep, then pulls on a palpation sleeve, lubes it up and prepares to palpate the mare. He finds that everything is in the right place in the mare, but that the fecal balls he encounters are dry and hard indicating slow passage through the digestive tract. He decides to administer mineral oil and water via a nasogastric tube as a laxative. He asks you to get a bucket, a nasogastric tube, a pump and a one gallon jug of mineral oil out of the truck. The pump he uses will pump 4 oz of fluid per stroke.

9. How many strokes will it take to pump the entire gallon of oil plus a gallon of water?
   A) 20
   B) 32
   C) 64
   D) 128

Remember, we are pumping **2** gallons of fluid (1 gal of mineral oil and 1 gallon of water). From the conversion reference 1 gal = 128 oz.

2 ~~gal~~ x 128 ~~oz~~ x 1 ~~stroke~~ = 64 strokes
$\qquad$ 1 ~~gal~~ $\qquad$ 4 ~~oz~~

The mare regains her alertness and as Mr. Wagoner walks her, she passes feces and seems relieved of the pain. Dr. Tietbaum checks the mare's heart rate and finds it has returned to normal. You leave the farm and return to the clinic. On the answering machine is a message form Ms. Minevra. Her dog, Fagan is a notorious garbage eater. Dr. Tietbaum has prescribed bismuth subsalicylate, an anti-diarrheal drug to be used whenever Fagan goes on one of his benders. Doc has prescribed 30 cc of the medication to be given every 2 hours PO as needed. Ms. Minerva is panicking because Fagan has been at the garbage again, but she has misplaced the large 50 cc syringe doc gave her to measure the medication out. It is too far for Ms. Minerva to come in for a new syringe.

10. How can Ms. Minerva accurately measure 30 cc at home?
    A) 6 teaspoons
    B) ½ cup
    C) ¼ cup
    D) 1 tablespoon

Using the conversion reference –
2 Tbsp = 1 oz = 30 ml and 3 tsp = 1 Tbsp therefore 6 tsp = 30 ml OR 1 tsp = 5 ml
½ cup = 4 oz = 125 ml
¼ cup = 2 oz = 62.5 ml
1 Tbsp = ½ oz or 15 ml

11. Ms. Minerva wants to measure the medicine in ounces. How many ounces of the medicine should she give to Fagan?
    A) 30
    B) 10
    C) 0.5
    D) 1

Using the conversion reference –
1 fluid oz = 30 ml

Dr. Tietbaum gives Ms. Minerva the instructions and has just hung up the phone when a pickup and stock trailer roll in to the clinic yard. You and doc arrive in the back of the clinic to find Rob Whey, the owner of Whey Out Dairy unloading a Holstein cow into the pens near the hydraulic chute. The cow is obviously lame on her left hind foot. The three of you get the cow into the chute and doc examines the foot. He diagnoses digital dermatitis also known as hairy heel warts. It is a tough disease to treat, and it is likely that quite of few of Mr. Whey's 500 Holsteins are affected. Dr. Tietbaum says he has just read an article about using a topical antibiotic spray to treat these cases and he wants to treat this as a herd problem, not just a single cow problem. As Rob loads the cow back into the trailer you and doc mix up the spray to send home with Rob to treat the whole herd. Dr. Tietbaum has you help him prepare several 16 gram packets of Lincomix powder. The spray will be created by mixing one 16 gram packet in 2 liters of water to create the correct concentration.

12. What is the concentration of the foot spray in mg/ml?
   A) 16 mg/ml
   B) 8 mg/ml
   C) 160 mg/L
   D) 80 mg/ml

Convert to mg/ml

$$\frac{16 \text{ gram}}{2 \text{ L}} = \frac{16000 \text{ mg}}{2000 \text{ ml}} = \frac{8 \text{ mg}}{\text{ml}}$$

This is an extra label use of this drug, so Dr. Tietbaum wants to make sure the instructions he puts on the label are clear. The direction portion of the label will read:

   Use as a topical spray at the rate of 20 cc per foot.
   Week 1 – Treat all feet of all cows once daily for 7 days.
   Week 2 and beyond – Treat all feet of cows with lesions only.

13. How many cows can be treated with a solution made with one packet of Lincomix?
   A) 10
   B) 25
   C) 50
   D) 100

One 16 gm packet is dissolved in 2 L of water which is 2000 ml. Each **foot** is to receive 20 ml (remember 1 cc = 1 ml). Each cow has 4 feet (or so we hope). Each **cow** will get 80 ml on all her feet, so the 2 L solution will treat 25 cows.

$$2000 \text{ ml} \times \frac{1 \text{ ft}}{20 \text{ ml}} \times \frac{1 \text{ cow}}{4 \text{ ft}} = 25 \text{ cows} \quad \textbf{OR} \quad 2000 \text{ ml} \times \frac{1 \text{ cow}}{80 \text{ ml}} = 25 \text{ cows}$$

14. How many packets of powder will need to be sent to the dairy for the first week of treatment?
   A) 500
   B) 320
   C) 140
   D) 20

From the problem above we know that 1 packet will treat 25 cows. The dairy has 500 cows that need treated every day for 7 days.

$$7 \text{ days} \times \frac{500 \text{ cows}}{\text{day}} \times \frac{1 \text{ packet}}{25 \text{ cows}} = 140 \text{ packets}$$

Mr. Whey reminds Dr. Tietbaum that the dairy had a bad Pink Eye (Infectious Bovine Keratoconjunctivitis) outbreak last year. He is already starting to see a few cases of the disease, and he wants to vaccinate this year against pink eye. Doc recommends using Maxi/Guard Moraxella bovis bacterin as it is labeled to be effective in the face of an outbreak. Mr.

Whey wants to purchase enough bacterin to protect the entire adult herd as well as 100 heifers he is raising. The dosage is 2 ml SQ and is provided in 100 ml vials at a cost of $30.50 per vial.

15. How much will Mr. Whey owe Dr. Tietbaum for the bacterin?
    A) $183.00
    B) $366.00
    C) $393.00
    D) $305.00

Mr. Whey needs 600 doses of bacterin dosed at 2 ml per dose from 100 ml vials that cost $30.50 per vial.
He will need to buy 1200 ml of bacterin, and therefore he will need to buy 12 of the 100 ml vials that each costs $30.50.

600 doses x 2 ml x   1 vial   x $30.50 = $366.00
                  dose   100 ml   vial

As Mr. Whey pulls out with his lame cow and enough bacterin to protect his herd from pinkeye, Dr. Teitbaum turns to you and congratulates you on a good day of veterinary practice. You feel good and are just turning to leave when Doc clears his throat and hands you the mop. The kennels still need to be cleaned.

CONVERSION REFERENCE

LIQUID MEASURES

1 gal = 4 qt. = 8 pt. = 16 cups = 128 oz. = ~3.785 L = ~3785 ml
1 qt. = 32 oz.
1 L = 1.06 qt. = 33.81 oz. = 0.227 gal
1 ml = 0.034 oz.
1 oz. = ~ 30 ml = 6 tsp. = 2 Tbsp. = 0.125 cup
1 tsp. = 5 ml
1 Tbsp. = 3 tsp. = 15 ml
1 cup = 0.5 pint = 0.25 qt. = ~ 240 ml = 8 oz. = 16 Tbsp. = 48 tsp.
½ cup = 0.25 pint = 0.125 qt. = 120 ml = 4 oz. = 8 Tbsp. = 24 tsp.
¼ cup = 0.125 pint = 0.0625 qt. = 60 ml = 2 oz. = 4 Tbsp. = 12 tsp.
1 ml = 1 cc

WEIGHT

1 lb = 0.45 kg
1 kg = 2.2 lb
1 ton = 2000 lb
1 mg = 0.001 gram
1 kg = 1000 gram

LENGTH

1 in = 2.5 cm
1 cm = 0.4 in
12 in = 1 ft.
3 ft = 1 yd
1 cm = 10 mm
1 m = 3.28 ft

TEMPERATURE

Fahrenheit = (Celsius x 1.8) + 32 OR (Celsius x 9/5) + 32
Celsius = (Fahrenheit – 32) x 0.555 OR (Fahrenheit - 32) x 5/9