Rubric and Sample Responses

Question 1

RUBRIC

Score	Description
5	Response demonstrates thorough understanding of patterns in placement of the decimal point when a decimal is multiplied or divided by a power of 10. Student explains procedure clearly and uses mathematical vocabulary. (5.NBT.2) • Assign 1 point for correct response in Part B. • Assign 2 point for correct explanation in Part C • Assign 2 points for correct response in Part D • Parts a and e are not scored. Students use their answer to part e for the next question.

SAMPLE RESPONSE

Highiron

b. 63,648

c. The population of Highiron is 636,479. You can find $\frac{1}{10}$ of this number by dividing by 10. If you move the decimal point one place to the left, this is the same as dividing by 24
10 because each place to the left is 10 times as big as the place to the right. Finally, round the number to the nearest whole.

d. To multiply by 100, first move the decimal point one place to the right to multiply by 10. Next, add one zero to the right-hand side of the number (after the 9) because adding a zero to that side is like multiplying by 10 more.

e. 7638

Felt

b. 63,323

c. The population of Felt is 632,323. You can find $\frac{1}{10}$ of this number by dividing by 10. If you move the decimal point one place to the left, this is the same as dividing by 10 because each place to the left is 10 times as big as the place to the right. Finally, round the number to the nearest whole.

d. To multiply by 100, first move the decimal point one place to the right to multiply by 10. Next, add one zero to the right-hand side of the number (after the 3) because adding a zero to that side is like multiplying by 10 more.

e. 9485

b. 12,685

c. The population of Brodner is 634,265. You can find $\frac{1}{10}$ of this number by dividing by 10. If you move the decimal point one place to the left, this is the same as dividing by 10, because each place to the left is 10 times as big as the place to the right. Finally, round the number to the nearest whole.

d. To multiply by 100, first move the decimal point one place to the right to multiply by 10. Next, add one zero to the right-hand side of the number (after the 5) because adding a zero to that side is like multiplying by 10 more.

e. 12685

Question 2

RUBRIC

Score	Description
2	Response demonstrates understanding of the effect of place value on the size of the number by describing how: • moving a digit one place to the right changes the value; and • moving a digit one place the left changes its value.

SAMPLE RESPONSE

The digit 4 in 3,489 represents 4 hundred while the digit 4 in 3,849 represents 4 tens. The digit 4 in 3,489 represents 10 times as much as the digit 4 in 3,849.

The digit 8 in 3,489 represent 8 tens while the digit 8 in 3,849 represents 8 hundreds. The digit 8 in 3,489 represents 1/10 of what the digit 8 represents in 3,849.

Question 3

RUBRIC

Score	Description
4	Response demonstrates understanding of reading, writing, comparing, and rounding decimals to thousandths. • Assign 1 point to a completely correct answer for each part.

SAMPLE RESPONSE

a. 436.125

b. 498.429

c, (4 x 100) + (9 x 10) + (8 x 1) + (4 x $\frac{1}{10}$) + (2 x $\frac{1}{1000}$ $\frac{1}{100}$) + (9 x $\frac{1}{1000}$)

d. 436.125 < 498.429

Question 4

RUBRIC

Score	Description
7	Response demonstrates ability to multiply and divide by powers of 10. • Assign 1 point for correctly completed table in Part a. Response demonstrates ability to read and write decimals to thousandths using base-ten numerals, number names, and expanded form. • Assign 2 points for a completely correct response in Part b. • Assign 1 point for correct response in Part c. Response demonstrates ability to compare two decimals to thousandths based on meanings of the digits in each place. • Assign 1 point for correct response in Part d. Response demonstrates understanding that a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. • Assign 2 points for correct response in Part e.

SAMPLE RESPONSE

a.

Vaccine Type	Dosage in liters	Dosage in deciliters	Dosage in centiliters	Dosage in milliliters
Rotavirus	0.001	0.01	0.1	1
All other vaccines	0.0005	0.0005	3	0.05

b. 0.0005 liters

c. (0 x1) + (0 x $\frac{1}{10}$) + (. x $\frac{1}{100}$) + (0 x $\frac{1}{1000}$) + (5 x $\frac{1}{10,000}$)

d. five ten-thousandths

e. The digit 1 in the number 0.001 is 100 times smaller than the digit 1 in the number 0.1.

f. The digits stay the same and in the same order, but the decimal point moves one place to the right as the metric units get smaller, showing that there are more small units than big ones for the same amount. Moving the decimal point one place to the right multiplies the number by 10, and moving the decimal point one place to the left divides numbers by 10.

Question 5

Vaccine	Cost per dose to the CDC clinic	Cost per dose to the CDC clinic, rounded to the nearest dollar	Dosage
Hepatits B	$11.08	$ 11	0.5 mL
Rotavirus	$63.96	$ 64	1.0 mL
DTaP	$15.38	$ 15	0.5 mL
Pneumonia	$112.44	$ 112	0.5 mL
Polio	$12.46	$ 12	0.5 mL
MMR	$19.91	$ 20	0.5 mL
Varicella	$78.34	$ 78	0.5 mL
Hepatitis A	$16.17	$ 16	0.5 mL

Question 6

RUBRIC

Score	Description
2	Response demonstrates understanding of multiplying and dividing by multiples of 10 by moving the decimal point. Parts a and b are not scored, but necessary to later calculations. • Assign 1 point for correct response in Part c. • Assign 1 point for correct response in Part d.

SAMPLE RESPONSE

Highiron

Part a.
Hepatitis B: $11 × 2082 = $22,902
Rotavirus: $64 × 1388 = $88,832
DTaP: $15 × 3470 = $52,050
Pneumonia: $112 × 2776 = $310,912
Polio: $12 × 2776 = $33,312
MMR: $20 × 1388 = $27,760
Varicella: $78 × 1388 = $108,264
Hepatitis A: $16 × 1388 = $22,208

b. $666,240

c. I could move the decimal point one place to the left because that is like dividing by 10.

d. I could move the decimal place two places to the right because that is like multiplying by 10 two times, or 100.

Felt

Part a.
Hepatitis B: $11 × 2586 = $28,446
Rotavirus: $64 × 1724 = $110,336
DTaP: $15 × 4310 = $64,650
Pneumonia: $112 × 3448 = $386,176
Polio: $12 × 3448 = $41,376
MMR: $20 × 1724 = $34,480
Varicella: $78 × 1724 = $134,472
Hepatitis A: $16 × 1724 = $27,584 32

b. $827,520

c. I could move the decimal point one place to the left because that is like dividing by 10.

d. I could move the decimal place two places to the right because that is like multiplying by 10 two times, or 100.

Brodner

Part a.

Hepatitis B: $11 × 3459 = $38,049
Rotavirus: $64 × 2306 = $147,584
DTaP: $15 × 5765 = $86,475
Pneumonia: $112 × 4612 = $516,544
Polio: $12 × 4612 = $55,344
MMR: $20 × 2306 = $46,120
Varicella: $78 × 2306 = $179,868
Hepatitis A: $16 × 2306 = $36,896

b. $1,106,880

b. $1,106,880

c. I could move the decimal point one place to the left because that is like dividing by 10.

d. I could move the decimal place two places to the right because that is like multiplying by 10 two times, or 100.