

# Quiz 2A, MTH 2010 - No Calculators

Dr. Graham-Squire, Spring 2017

Name: \_\_\_\_\_

Key

9:13

→ 20 minutes.

1. (2 points) Calculate the following:

(a)  $3 + (-5) = -2$

(b)  $15 - (-8) = 23$

(c)  $-9 + (-3) = -12$

(d)  $-7 - (-9) = -7 + 9 = \boxed{2}$

2. (3 points) A student has the following work for the subtraction problem  $736 - 572$ :

$$\begin{array}{r} 13 \\ 7 \cancel{3} 6 \\ - 6 \cancel{7} 2 \\ \hline 1 6 4 \end{array}$$

$$\begin{array}{r} 6 13 \\ 736 \\ - 572 \\ \hline 164 \end{array}$$

Is the student's answer correct? If not, what is the correct calculation? If the answer is correct, how is the student's method of calculation different from the standard method of subtraction? Will their method always work, or did the student just get lucky on this problem?

Yes, the answer is correct. The student added to the 5 instead of borrowing from the 7. Since subtracting 1 from the top or adding one to the bottom will always give the same result, this method will always work and is valid (if a bit odd).

3. (3 points) Jack pours  $\frac{3}{4}$  gallon of paint from a paint can into an empty bucket, and then pours  $\frac{1}{5}$  of the paint in the bucket back into the can. How much paint is left in the bucket?

Which of the following answers gives an appropriate calculation for how to find the answer? Show/explain your reasoning!

(A)  $\frac{3}{4} - \frac{1}{5}$

(B)  $\frac{3}{4} \times \frac{1}{5}$

(C)  $1 - \left(\frac{1}{5} \times \frac{3}{4}\right)$

- (D) There is not enough information in the problem to calculate how much paint is left in the bucket. (If you choose this answer, you should explain below why there is not enough information)

- ✓✓ (E) The answer cannot be calculated by any of the expressions above, but CAN be calculated by some other expression. (If you choose this answer, you should say below what that other calculation is)

✓  $\frac{3}{4} - \frac{1}{5} \left(\frac{3}{4}\right)$  which is  $\frac{3}{4}$  gallon  
 ↑ start      ← poured out      of the paint

$$\frac{3}{4} - \frac{1}{5} \left(\frac{3}{4}\right) = \frac{15}{20} - \frac{3}{20} = \frac{12}{20} = \frac{3}{5}$$

4. (2 points) A student did the work below to answer the word problem: "Cole has a collection of Pokemon cards. He gave 26 Pokemon cards to his friend Camden. Now he has 43 Pokemon cards. How many remain in his collection?"

$$\begin{array}{r} 3 \ 13 \\ 4 \ 3 \\ - 2 \ 6 \\ \hline 1 \ 7 \end{array}$$

Does the student have the correct solution to the problem? Explain why or why not.

~~This~~ The solution is wrong. The correct answer is 43, because that is how many he has now. The question is stupid, and probably should have asked "How many did he originally have," or say "He originally had 43 cards."

# Quiz 2B, MTH 2010 - No Calculators

Dr. Graham-Squire, Spring 2017

Name: \_\_\_\_\_

Key

1. (3 points) Jack pours  $\frac{3}{5}$  gallon of paint from a paint can into an empty bucket, and then pours  $\frac{1}{4}$  of the paint in the bucket back into the can. How much paint is left in the bucket?

Which of the following answers gives an appropriate calculation for how to find the answer? Show/explain your reasoning!

(A)  $1 - \left(\frac{1}{4} \times \frac{3}{5}\right)$

(B)  $\frac{3}{5} \times \frac{1}{4}$

(C)  $\frac{3}{5} - \frac{1}{4}$

- (D) The answer cannot be calculated by any of the expressions above, but CAN be calculated by some other expression. (If you choose this answer, you should say below what that other calculation is)

- (E) There is not enough information in the problem to calculate how much paint is left in the bucket. (If you choose this answer, you should explain below why there is not enough information)

$$\frac{3}{5} - \frac{1}{4} \left( \frac{3}{5} \right)$$

↑ paint in bucket  
↓ pour out  
↑  $\frac{3}{5}$  gallon  
↓  $\frac{1}{4}$  of paint in bucket

$$\frac{3}{5} - \frac{1}{4} \left( \frac{3}{5} \right)$$

2. (2 points) Calculate the following:

(a)  $5 + (-8) = 5 - 8 = \boxed{-3}$

(b)  $11 - (-13) = 11 + 13 = \boxed{24}$

(c)  $-6 + (-7) = \boxed{-13}$

(d)  $-5 - (-8) = -5 + 8 = \boxed{3}$

3. (2 points) A student did the work below to answer the word problem: "Cole has a collection of Pokemon cards. He gave 37 Pokemon cards to his friend Camden. Now he has 52 Pokemon cards. How many remain in his collection?"

$$\begin{array}{r} 4 \quad 12 \\ \cancel{5} \quad \cancel{2} \\ - \quad 3 \quad 7 \\ \hline 1 \quad 5 \end{array}$$

Does the student have the correct solution to the problem? Explain why or why not.

No. He has 52 P. cards, so 52 remain in his collection. The question is stupid.

It should say "How many did he have originally?" or "Originally he had 52 P. cards..."

4. (3 points) A student has the following work for the subtraction problem  $847 - 584$ :

$$\begin{array}{r} 14 \\ 8 \quad \cancel{4} \quad 7 \\ - \quad \cancel{6} \quad 8 \quad 4 \\ \hline 2 \quad 6 \quad 3 \end{array}$$

$$\begin{array}{r} \text{Standard} \\ \hline 7 \quad 14 \\ \cancel{8} \quad \cancel{4} \quad 7 \\ - \quad 5 \quad 8 \quad 4 \\ \hline 2 \quad 6 \quad 3 \end{array}$$

Is the student's answer correct? If not, what is the correct calculation? If the answer is correct, how is the student's method of calculation different from the standard method of subtraction? Will their method always work, or did the student just get lucky on this problem?

Yes, their answer is correct, and yes this method will always work. Instead of doing  $8-1$  to get 7, then subtracting 5 (as in the standard), the student added one to 5 and did  $8-6$ . Since

$$8 - 1 - 5 = 8 - (1+5)$$

this will get the same result.

$$\begin{array}{r} \text{"} \\ 7 - 5 \\ \uparrow \\ \text{standard} \end{array} \quad \begin{array}{r} \text{"} \\ 8 - 6 \\ \uparrow \\ 2 \quad \text{student} \end{array}$$