

Unit 4 Study Guide: Expressions and Equations No Calculator

- 7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- 7.EE.2** Understand that rewriting an expression in different forms in a problem context can shed light on a problem and how the quantities are related.
- 7.EE.3** Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
- 7.EE.4a.1** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
- 7.EE.4b** Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
- b. Solve word problems leading to inequalities of the form or where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.

1.

Determine which expression is equivalent to $\frac{3}{4} - x\left(\frac{1}{2} - \frac{5}{8}\right) + \left(-\frac{3}{8}x\right)$.

A $-\frac{3}{4}x$

B $\frac{1}{2}x$

C $\frac{1}{4} - \frac{7}{8}x$

D $\frac{3}{4} - \frac{1}{4}x$

$$\begin{aligned} & \frac{3}{4} - \frac{1}{2}x + \frac{5}{8}x + \left(-\frac{3}{8}x\right) \quad \leftarrow \text{common denominator} \\ & \frac{6}{8} - \frac{4}{8}x + \frac{5}{8}x + \left(-\frac{3}{8}x\right) \\ & \frac{6}{8} + \frac{1}{8}x - \frac{3}{8}x \\ & \frac{6}{8} - \frac{2}{8}x \quad \leftarrow \text{reduce/simplify} \\ & \frac{3}{4} - \frac{1}{4}x \end{aligned}$$

2. Which expressions are equivalent to the expression $(x - y)\frac{5}{8} - \frac{1}{4}x + y$?

Select each correct answer

A $\frac{3}{8}x + \frac{3}{8}y$

B $\frac{3}{8}x + 1\frac{5}{8}y$

C $\frac{5}{8}x - y - \frac{1}{4}x + y$

D $\frac{5}{8}x - \frac{5}{8}y - \frac{1}{4}x + y$

E $\frac{5}{8}x - \frac{1}{4}x + y - \frac{5}{8}y$

$$\begin{aligned} & (x - y)\frac{5}{8} - \frac{1}{4}x + y \\ & \frac{5}{8}x - \frac{5}{8}y - \frac{1}{4}x + y \quad \leftarrow \text{still distribution} \end{aligned}$$

$$\frac{5}{8}x - \frac{5}{8}y - \frac{1}{4}x + y$$

$$\frac{5}{8}x - \frac{5}{8}y - \frac{2}{8}x + \frac{8}{8}y$$

$$\frac{3}{8}x + \frac{3}{8}y$$

D, E just in different order

Name: _____

Period: _____

3. Jordan's dog weighs p pounds. Emmett's dog weighs 25% more than Jordan's dog. Which expressions represent the weight, in pounds, of Emmett's dog? Select each correct answer.

- A. $.25p$
- B. $1.25p$
- C. $p + 0.25$
- D. $p + 1.25$
- E. $p + 0.25p$

$p \rightarrow$ Jordan's dog

$$\underbrace{.25p}_{\text{the extra 25\%}} + \underbrace{p}_{\text{the initial weight}} = 1.25p \quad \text{or} \quad .25p + p$$

2. Which expressions are equivalent to $-2.5(1 - 2n) - 1.5n$?

Select **all** that apply.

A. $-2.5 - 3.5n$

B. $-2.5 + 3.5n$

C. $-2.5 - 6.5n$

D. $-2.5 - n(5 - 1.5)$

E. $-2.5 + n(5 - 1.5)$

$$-2.5 + 5n - 1.5n = -2.5 + 3.5n$$

no

$$-2.5 - 5n + 1.5n = -2.5 - 3.5n \quad \emptyset$$

yes

$$-2.5 + 5n - 1.5n = -2.5 + 3.5n$$

5. Sofia bought a package of pencils for \$2.75 and some erasers that cost \$0.25 each. She paid a total of \$6.25 for these items, before tax.

Exactly how many erasers did Sofia buy?

$$\begin{array}{r} 2.75 + 0.25e = 6.25 \\ -2.75 \quad -2.75 \end{array} \quad 1 \text{ pt.}$$

$$0.25e = 3.50 \quad 1 \text{ pt}$$

$$\begin{array}{r} 0.25e = 3.50 \\ \hline .25 \quad .25 \end{array} \quad 1 \text{ pt}$$

$$e = 14$$

14 erasers 1 pt

Unit 4 Study Guide: Expressions and Equations Calculator

A teacher surveyed students in four classes to determine the location for a field trip. Each student chose only one location. The table shows the number of students from each class who chose each location.

Field Trip Choices

Class	Number of Students Who Chose the Zoo	Number of Students Who Chose the Museum	Number of Students Who Chose the Planetarium	<u>Total</u>
Class E	10	9	8	27
Class F	8	11	11	30
Class G	12	8	5	25
Class H	6	10	8	24

6.

Part A.

Determine the percent of students in each class who chose the museum. What is the order, from least to greatest, of the percents for each class?

$$E \quad \frac{9}{27} = 33\%$$

$$F \quad \frac{11}{30} = 37\%$$

$$G \quad \frac{8}{25} = 32\%$$

$$H \quad \frac{10}{24} = 42\%$$

- A. ~~Class E, Class F, Class G, Class H~~
- B. Class G, Class E, Class F, Class H
- C. Class G, Class E, Class H, Class F
- D. ~~Class H, Class F, Class E, Class G~~

Part B

The total number of students who chose the zoo is how many times as great as the total number of students who chose the planetarium?

- A. 1
- B. $1 \frac{1}{18}$
- C. $1 \frac{1}{8}$
- D. $1 \frac{1}{9}$

36 zoo

32 planetarium

$$\frac{36}{32} = 1 \frac{4}{32} = 1 \frac{1}{8}$$

7. Part A

At HCMS, 75 band members need to raise a total of \$8,250 for a trip. So far, they have raised \$3,120.

How much money, in dollars, per band member still needs to be raised for the trip?

$$8250 - 3120 = \frac{5130}{75} \quad \$168.40$$

Part B

The entire band decides to have a concert to raise the money for the trip. Tickets for the concert will cost \$7.50 each. A local business agrees to donate an additional \$0.50 for each \$1.00 in ticket sales to the band for their trip.

$$7.50t + 3.75t$$

\uparrow ticket \uparrow half a ticket

What is the LEAST number of concert tickets the band must sell in order to raise the rest of the money needed for the trip?

$$7.50t + 3.75t > 5130$$

$$11.25t > 5130$$

$$\frac{11.25t > 5130}{11.25} \quad \frac{5130}{11.25}$$

$$t > 456 \text{ tickets}$$

8.

Sal exercised by stretching and jogging 5 days last week.

- He stretched for a total of 25 minutes during the **week**.
- He jogged for an equal number of minutes each of the 5 days.
- He exercised for a total of 240 minutes.

Elena also exercised by stretching and jogging 5 days last week.

- She stretched for 15 minutes each **day**.
- She jogged for an equal number of minutes each of the 5 days.
- She exercised for a total of 300 minutes.

Determine the number of minutes Sal jogged each day last week ^① and the number of minutes Elena jogged each day last week. Show your work or explain all the steps you used to determine your answers. ^② ^③

Enter your answers and your work or explanation in the space provided.

Sal

$$240 - 25 = 215 \div 5 = 43 \text{ minutes}$$

\uparrow total \uparrow stretching \uparrow days

Elena

$$300 - 15(5) = 300 - 75 = 225 \div 5 = 45 \text{ minutes}$$

\uparrow total \uparrow stretching \uparrow 5 days