



Level 3: Expressions and Equations Posttest Answer Key

Question 1:

Two flight attendants are preparing for a stop along a route. Some passengers will leave and others will board the plane. While waiting for the new passengers, they count the number of rows with one, two, and three available seats. One attendant counts in the front half of the cabin while the other counts in the rear. They have the following expression for the total number of available seats.

$$3a + 2b + c + 3d + 2e + f$$

Which of the following is an equivalent expression?

- a. $3ab + 2be + cf$
- b. $6ab + 4be + 2cf$
- c. $3(a + d) + 2(b + e) + c + f$
- d. $6(a + b) + 4(b + e) + 2(c + f)$

Question 2:

A meteorologist is constructing a computer model for predicting the strength of winter storms. He uses the following expression:

$$2(3y - 2) - 4(1 - y).$$

Which of the following is equivalent to this expression?

- a. $7y - 6$
- b. $5y - 6$
- c. $10y - 8$
- d. $5y - 8$

Question 3:

A pharmacist is preparing a prescription. The accurate dosage can be determined by using the following expression:

$$x + \frac{3}{8}(x + 2h) + h.$$

Which expression is equivalent?

- a. $\frac{11x}{8} + 3h$
- b. $\frac{4x + 7h}{8}$
- c. $\frac{11x + 14h}{8}$
- d. $\frac{3x}{8} + \frac{3h}{4}$



Question 4:

A real estate agent helps a client estimate the monthly mortgage payment for a house. The agent uses the expression:

$$2(p + c) - 0.25(s - 4c).$$

Which of the following is an equivalent expression?

- a. $1.75p + 3c$
- b. $2p - 0.25s + 3c$
- c. $2p - 0.25s + c$
- d. $2p - 25s - 98c$

Question 5:

A high school teacher calculates her students' quarter average using the expression below.

$$\frac{1}{5}(a + 2b + 2c).$$

Write an equivalent expression without parentheses.

$$\frac{1}{5}a + \frac{2}{5}b + \frac{2}{5}c$$

Question 6:

The altitude of an airplane is changing at a rate of -150 feet per minute.

At that rate, what is the change in the altitude of the airplane in 2.5 minutes?

- a. 375
- b. 60
- c. -60
- d. -375



Question 7:

Karina bought 4 packages of the type of gum shown.



- Each package contains 3 more than the usual number of sticks of gum.
- Karina bought a total of 60 sticks of gum.

Which equation could be solved to find n , the usual number of sticks of gum in each package?

a. $4(n - 3) = 60$

b. $4(n + 3) = 60$

c. $4n - 3 = 60$

d. $4n + 3 = 60$

Question 8:

Rebecca goes to a store that sells beads.

- She has \$20 to spend.
- She buys 15 large beads that cost \$0.40 each.
- She wants to buy small beads that cost \$0.28 each.

Which inequality can be solved to determine n , the number of small beads Rebecca can buy?

a. $15(0.4) + 0.28n \leq 20$

b. $15(0.4) - 0.28n \leq 20$

c. $15(0.4) + 0.28n \geq 20$

d. $15(0.4) - 0.28n \geq 20$



Question 9:

Alex repairs clocks at a shop.

- He earns \$96 per day plus \$16 per hour for every hour of overtime he works.
- Each day, he wants to earn a total of at least \$130.

Which inequality can be used to determine h , the number of hours of overtime Alex must work to earn at least \$130?

- a. $96 + 16h \leq 130$
- b. $96 + 16h \geq 130$
- c. $96h + 16 \leq 130$
- d. $96h + 16 \geq 130$

Question 10:

Tania is going to buy n pencils, n pens, and n notebooks. The total cost in dollars is given by the expression below.

$$0.25n + 1.50n + 1.75n$$

Rewrite the expression as a single term.

$$3.5n$$

Question 11:

Frank is riding his bike.

- He will ride a total of 20 miles.
- He rode at a speed of 15 miles per hour for the first 0.75 hour.

How many **more** miles does Frank have left to complete his ride?

8.75 miles



Question 12:

An airplane flew at a speed of 320 miles per hour for 3 hours, and then for h hours at a speed of 240 miles per hour. The total distance the airplane flew was 1260 miles.

What is the value of h , in hours?

1.25 hours

Question 13:

A trapezoid has a base of 4.5 inches, a height of 6 inches, and an area of 21 square inches. The equation below can be used to determine b_2 , the length in inches of the second base of the trapezoid.

$$\frac{1}{2}(4.5 + b_2)(6) = 21$$

What will be the length, in inches, of the second base of the trapezoid?

2.5 inches

Question 14:

A truck driver is stopped along a highway rest stop.

- He has traveled 50 miles so far.
- He is traveling at an average rate of 60 miles per hour.
- He will travel a total of 230 miles to reach his destination.

At the rate he has been traveling, how many hours will it take the truck driver to travel from the rest stop to his destination?

3 hours

Question 15:

Martin bought 6 bottles of olive oil. Each bottle contained $\frac{4}{5}$ quart of oil.

What is the total number of quarts of olive oil that Martin bought?

$4\frac{4}{5}$ qt



Question 16:

Lawrence is hiking $5\frac{1}{2}$ miles to a waterfall. After hiking $2\frac{3}{5}$ miles, he stops for lunch.

How much farther does Lawrence have to go to reach the waterfall?

- a. $2\frac{1}{10}$ miles
- b. $2\frac{2}{3}$ miles
- c. $2\frac{9}{10}$ miles
- d. $3\frac{2}{3}$ miles

Question 17:

The population of a city was 126,000 in the year 2000. Since then, it has been decreasing at a rate of 1,400 per year.

At that rate, which inequality could be used to determine t , the number of years after 2000 it will take for the population to be less than 100,000?

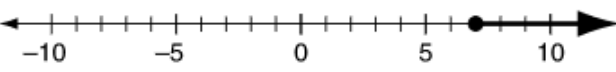
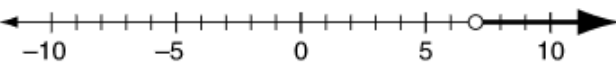
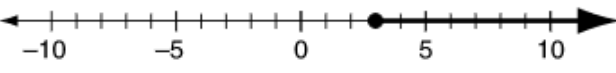
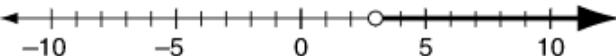
- a. $126,000t + 1,400 < 100,000$
- b. $126,000t - 1,400 < 100,000$
- c. $126,000 + 1,400t < 100,000$
- d. $126,000 - 1,400t < 100,000$

Question 18:

David is reading a book with more than 200 pages. He has read 80 pages so far at a rate of 40 pages per hour. The inequality below shows the number of hours, x , that David has left to read to finish the book.

$$40x + 80 > 200$$

Which number line shows the solution to the inequality?

- a. 
- b. 
- c. 
- d. 

Continue 



Question 19:

Matthew is changing a tire on his car.

- The jack is holding 800 pounds of the car's total weight of 3300 pounds.
- Two tires are off the ground.
- The rest of the car's weight is distributed evenly between the other two tires.

What is the weight, in pounds, on **each** of the two tires?

1,250 pounds

Question 20:

Lucy draws a rectangle that is not a square. The perimeter of the rectangle can be represented by the expression $12w$, where w is the width of the rectangle in inches.

Which equivalent expression can Lucy write that will help her find the length of the rectangle?

- a. $6(2w)$
- b. $4(3w)$
- c. $2(3w + 3w)$
- d. $2(w + 5w)$

Question 21:

A baker is making cakes.

- She starts with 48 eggs.
- She makes 10 cakes.
- She has 18 eggs left over.

Which equation can be used to find the number of eggs, x , the baker uses in each cake?

a. $10x + 18 = 48$

b. $18x + 10 = 48$

c. $10(x + 18) = 48$

d. $18(x + 10) = 48$



Question 22:

Erica goes to a carnival.

- The admission cost is \$5.
- Each game ticket costs \$0.50.
- Erica can spend no more than \$20 at the carnival.

Which inequality can be used to find the number of game tickets, t , Erica can buy?

a. $0.5t + 5 \geq 20$

b. $5 + 0.5t \leq 20$

c. $20 - 0.5t \leq 5$

d. $0.5t - 20 \geq 5$

Question 23:

Milly is in charge of a spaghetti dinner fundraiser. She must buy enough spaghetti to feed at least 75 people. Each box of spaghetti costs \$2.29, and will serve 8 people.

What is the **least** amount she must spend to have enough spaghetti?

a. \$18.32

b. \$20.61

c. \$21.47

d. \$22.90

Question 24:

Last year, the population of a city was estimated to be 298,500 people. This year, the population decreased by about 3.3%.

Which is the **best** estimate of the population this year?

a. 290,000

b. 295,000

c. 305,000

d. 310,000