

GSE Algebra
Unit 1 Review
Relationships between Quantities & Expressions
Part A: NO CALCULATOR ALLOWED

Multiple Choice and Constructed Response

Identify the choice that best completes the statement or answers the question. **NO WORK, NO CREDIT!**

- 1) The length of a rectangle is 8 units less than its width x . Write an expression that shows the length of the rectangle. **(A.SSE.1b)**

Work for 1)

- 2) To rent a bicycle, a bike shop charges a deposit plus an hourly rate. Martin can determine how much he will have to pay for a rental lasting t hours by using the expression $5t + 30$. What does the constant 30 most likely represent? **(A.SSE.1a)**

- A. the length of time of the rental
 B. insurance for the bicycle
 C. the hourly rate for renting the bicycle
 D. the deposit for the bicycle

Work for 2)

$5t + 30$: _____
 30: _____
 5t: _____
 5: _____

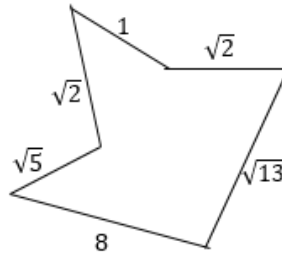
- 3) A human heart beats at a rate of about 60 beats per minute. Therefore, the total number of beats, b , in m minutes can be represented by the equation $b = 60m$. Which of the following could not be a value for m ? **(N.Q.2)**

- A. zero C. decimals
 B. negative numbers D. numbers greater than 60

Work for 3) An example of...

zero: _____
 negative numbers: _____
 decimals: _____
 numbers greater than 60: _____

- 4) The side lengths of a polygon are shown in the figure below.



- Create an expression that represents the perimeter of the figure. **(N.RN.2)**

Work for 4)

- 5) Given: $L = \sqrt{25}$, $M = 3\sqrt{30}$, $N = \sqrt{10}$, $P = \sqrt{9}$

Which expression results in a rational number?

(N.RN.2,3)

- A. $L + M$ C. $N + P$
 B. $M + N$ D. $P + L$

Work for 5)

- 6) Which sum is irrational? **(N.RN.3)**

- A. $\frac{8}{7} + \sqrt{9}$ C. $\sqrt{81} + 2^5$
 B. $6 + \sqrt{6}$ D. $\sqrt{25} + 3.5$

Work for 6)

Name _____

7) Marco is trying to decide whether the product of two irrational numbers is rational or irrational.

Which of the following correctly describes this product and gives the appropriate supporting examples?

(N.RN.3)

A. The product is always irrational.

Example factors: $\sqrt{3} \cdot \sqrt{2}$ and $\sqrt{6} \cdot \sqrt{10}$

B. The product is always rational.

Example factors: $\sqrt{5} \cdot \sqrt{5}$ and $\sqrt{8} \cdot \sqrt{8}$

C. The product may be either rational or irrational

Example factors: $\sqrt{3} \cdot \sqrt{3}$ and $\sqrt{12} \cdot \sqrt{2}$

D. The product will be neither rational nor irrational.

Example factors: $\sqrt{8} \cdot \sqrt{1}$ and $\sqrt{1} \cdot \sqrt{0}$

Work for 7)

8) Simplify the following expression. **(N.RN.2)**

$$\sqrt{27} - \sqrt{75}$$

Work for 8)

Date _____

9) Carlisle is going to a fabric supply store to buy materials for her crafts. She knows that she needs 15 feet of blue yarn and is wondering how much she will spend. Which unit will most likely be used to determine the cost of her yarn? **(N.Q.1a)**

A. dollars per minute

B. feet of yarn per minute

C. dollars per foot of yarn

D. balls of yarn per day

Work for 9)

Name _____

Date _____

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Part B: CALCULATOR ALLOWED

10) What is the result of $(-9x - 7) + (-5x + 1)$? **(A.APR.1)**

Work for 10)

11) Simplify the following expression. **(A.APR.1)**
 $(3x^2 + 7x - 6) - (x^2 - 10x + 2)$

Work for 11)

12) What is the product of $5x + 3$ and $8x - 7$?
(A.APR.1)

Work for 12)

13) In a test, engineers determined that a bicycle can travel at a top speed of 30 feet per second. What is the top speed the bicycle can travel in miles per hour? (1 mile = 5,280 feet) **(N.Q.1b)**

- A.** 0.34 *mph* **C.** 158,400*mph*
B. 20.5 *mph* **D.** 0.006 *mph*

Work for 13)

14) Matt went to exercise by walking around a track at his local college. He wore a pedometer to record how many steps he took. He started the pedometer when he began walking around the track. Each lap around the track is $\frac{1}{4}$ mile. At the end of 6 laps, the pedometer showed that he took 12,000 steps. Which of the following quantities could be used to describe his exercise? **(N.Q.1c)**

- A.** 8,000 miles/step **C.** 2,000 laps/step
B. 2,000 steps/mile **D.** 2,000 steps/lap

Work for 14)

15) Michael Phelps consumes 15,000 calories per day. Swimming the butterfly stroke burns 1200 calories per hour. Michael can swim an average of 2 laps per minute.

How many laps would he need to swim to burn all of the 15,000 calories? **(N.Q.1c)**

- A.** 0.15 **C.** 1,500
B. 150,000 **D.** 3,000

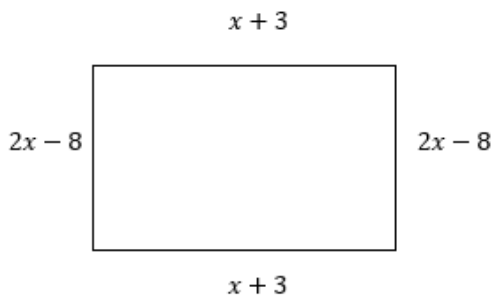
Work for 15)

Name _____

Date _____

Extended Constructed Response

16) The perimeter of a rectangle is the sum of the lengths of its sides. The area of a rectangle is the product of the rectangle's length and width. If l is the length of a rectangle and w is the width, then its perimeter = $2l + 2w$ and its area = lw . Use the rectangle below to answer the questions that follow. **(A.APR.1)**



a) What is the rectangle's perimeter?

b) What is the rectangle's area?

17) Dani and Jack went on a hike that started at an elevation of 3000 feet. During the hike, they gained 450 feet of elevation per hour, h . Their total elevation, E , can therefore be represented by the equation

$$E = 450h + 3000.$$

a) Identify each part of the equation as a coefficient, variable, constant, or term. **(A.SSE.1a)**

E :

450:

$450h$:

3000:

b) Identify the dependent and independent variables.

Dependent: _____

Independent: _____