

Benchmark #1 (Units 1-4) Review

Unit 1: Number Sense

Directions: Identify the following numbers as either **Rational** or **Irrational** numbers. Write the entire word **Rational** or **Irrational** on the line provided.

1. _____ $\bar{.1}$
2. _____ $\sqrt{50}$
3. _____ $\sqrt[3]{64}$
4. _____ 16.14
5. _____ 17.1267...

Directions: What two rational numbers do the following fall between? (3 points each)

6. $\sqrt{20}$ falls between _____ and _____ on the number line
but is closer to _____.
7. $\sqrt[3]{29}$ falls between _____ and _____ on the number line.
but is closer to _____.

Directions: Convert the following fractions to decimals and decimals to fractions. All answers must be completely simplified. Show all work to receive full credit.

8. $\frac{7}{8} = \underline{\hspace{2cm}}$

9. $\frac{7}{9} = \underline{\hspace{2cm}}$

10. $.54 = \underline{\hspace{2cm}}$

11. $.\bar{7} = \underline{\hspace{2cm}}$

Directions: Simplify the following radical expressions.

12. $\sqrt{75} = \underline{\hspace{2cm}}$

13. $\sqrt[3]{128} = \underline{\hspace{2cm}}$

14. $\sqrt[3]{56} = \underline{\hspace{2cm}}$

15. $\sqrt{300} = \underline{\hspace{2cm}}$

Directions: Solve the following equations. Show all work to receive full credit. All answers must be completely simplified.

16. $x^2 = 121$

17. $x^3 = 8$

18. $x^3 = 125$

19. $x^3 = 56$

Unit 2: Scientific Notation

Directions: Use properties of exponents to simplify completely.

1) $z^0 = \underline{\hspace{2cm}}$

2) $3^{-3} = \underline{\hspace{2cm}}$

3) $\left(\frac{4}{9}\right)^{-2} = \underline{\hspace{2cm}}$

4) $p^{-3} \cdot p^{-5} = \underline{\hspace{2cm}}$

5) $\frac{p^{-3}}{p^{-5}} = \underline{\hspace{2cm}}$

6) $\frac{x^{11}}{x^{-4}} = \underline{\hspace{2cm}}$

Directions: Use properties of exponents to simplify completely.

7) $y^{-2} \cdot y^5 \cdot y^{-5} =$ _____

8) $\frac{xy^{-5}}{xy} =$ _____

9) $z^7 \cdot z^2 \cdot z =$ _____

10) $(y^3)^{-2} =$ _____

Directions: Write the following in scientific notation.

11) $4,210,000 =$ _____

12) $0.0000421 =$ _____

13) $29 \times 10^4 =$ _____

14) $.014 \times 10^{-3} =$ _____

Directions: Write the following in standard form.

15) $3.15 \times 10^6 =$ _____

16) $3.15 \times 10^{-6} =$ _____

Directions: Order the following from least to greatest.

17) 1.14×10^5 , 114×10^5 , 0.014×10^{-3} , 11.4×10^{-3}

_____ , _____ , _____ , _____

Directions: Perform the indicated operations. Express solutions in scientific notation.

18) $(2.3 \times 10^{-1})(1.4 \times 10^5) =$

19) $(1.92 \times 10^5) \div (9.6 \times 10^{-3}) =$

20) $(4.2 \times 10^{-2}) + (3.7 \times 10^{-2}) =$

21) $(1.7 \times 10^6) - (1.5 \times 10^6) =$

Directions: Use your knowledge of scientific notation to answer the following questions.

22) 9×10^6 is approximately _____ times larger than 3×10^4 .

23) If there are approximately 3×10^8 people in the United States and approximately 7×10^9 people in the world, then the world population is approximately _____ times larger than the population of the United States.

24) Which of the following rates would be best to use to describe the rate of the sea level rising?

A. 1.5×10^0 mm/year

B. 1.5×10^{-1} cm/year

C. 1.5×10^{-2} dm/year

D. 1.5×10^{-3} m/year

Unit 3: Linear Equations

Directions: For items #1-12 you must

- Solve each equation.
- Show ALL WORK to solve the equation.
- Show ALL WORK to CHECK the solution.
- If there is no solution or infinitely many solutions, state this. You do not need to do a check for these.

1. $\frac{y}{8} = -4$

2. $12 + z = 11$

Solution: _____
1...Check

Solution: _____
2...Check

3. $\frac{3}{8}y + 5 = 20$

4. $2 - 2.5a = 27$

Solution: _____
3...Check

Solution: _____
4...Check

5. $-9 - a = 4$

Solution: _____
5...Check

6. $12 = a - 4a + 3a$

Solution: _____
6...Check

7. $-10(z + 4) = -10$

Solution: _____
7...Check

8. $5 + 3(x - 5) = 20$

Solution: _____
8...Check

9. $-1 - 4z = 5z - 10$

Solution: _____
9...Check

10. $10 + 8x = 6x - 18$

Solution: _____
10...Check

11. $2(y + 6) = 5y + 12 - 3y$

Solution: _____
11...Check

12. $12 - 5x + x = 4(x + 1)$

Solution: _____
12...Check

Unit 4: Rate of Change and Linear Relationships

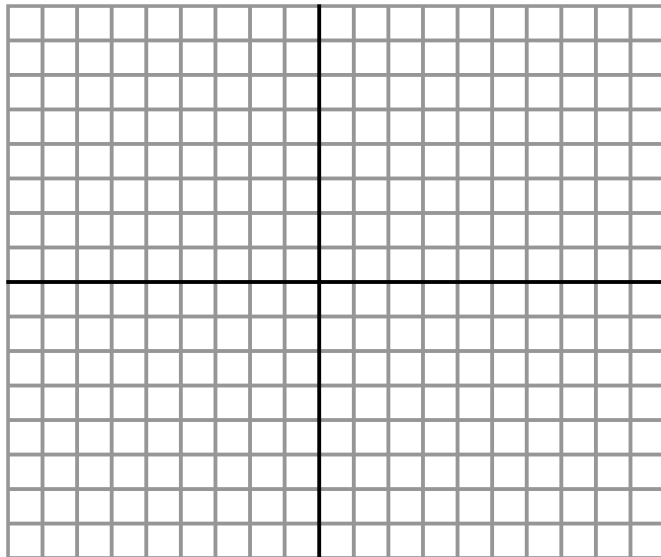
Directions: Answer all parts of the following questions about proportional relationships. Show all work. Be sure to include all appropriate units.

1) Alex spent \$18.00 on 24 golf balls.

- a) Find the unit cost.
- b) Write the equation that models this situation.
- c) First, indicate what x and y both represent. Then, use the equation you wrote in part b to complete the table.

_____ (x)	0	2	4	6	8
_____ (y)					

- d) Graph the line that models this situation by plotting and connecting the points from the table.



- e) What is the **slope** of the line?

Directions: Determine if the ratios below are proportional. Either simplify both fractions and compare or check for a scale factor. Show all work.

2) $\frac{1}{5} \square \frac{6}{30}$

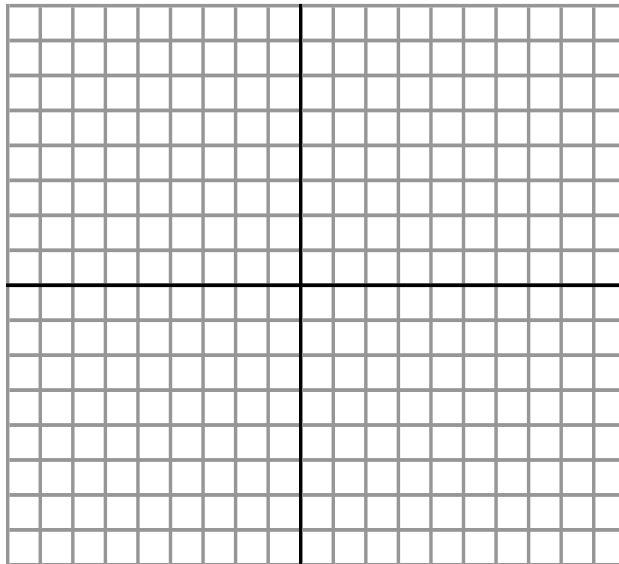
3) $-\frac{15}{6} \square \frac{-5}{-2}$

4) $-\frac{6}{9} \square \frac{20}{30}$

Directions: Answer the following questions about slope. Show all work used to support your answers.

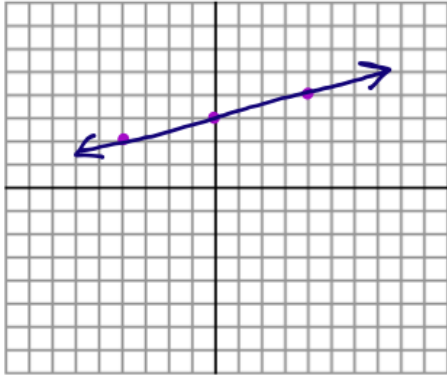
5) If the slope of the line that contains points A and B is $\frac{9}{27}$ and the slope of the line that contains points A and C is $\frac{-2}{-6}$, are points A, B, and C collinear?

6) Point A has coordinates (1, 3), Point B has coordinates (2, 6), and Point C has coordinates (-1, -6), are A, B, and C collinear?



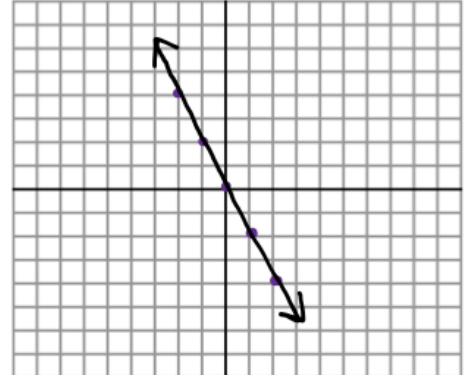
Directions: Write the equations of the following linear relationships.

7)



Equation _____

8)



Equation _____

9)

x	3	2	1	0	-1
y	-4	-1	2	5	8

Equation _____

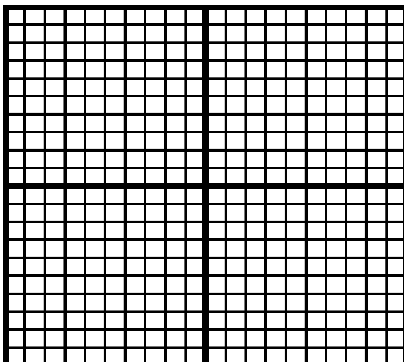
10)

x	y
2	3
4	7
6	11
8	15
10	19

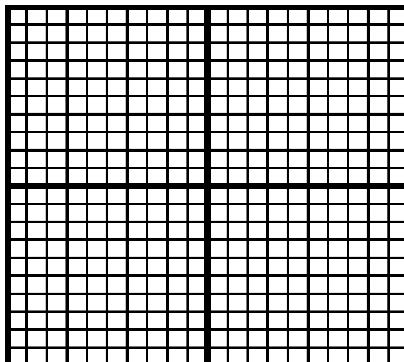
Equation _____

Directions: Graph each line. Plot as many points as possible on the given coordinate plane.

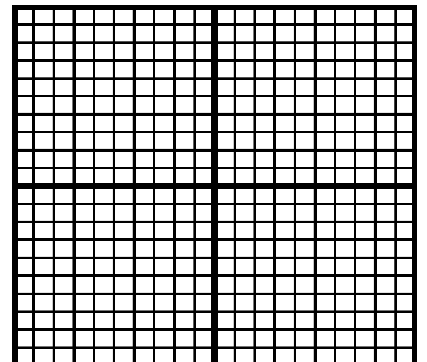
11) $y = 3x - 4$



12) $y = -\frac{1}{2}x + 2$



13) $y = -\frac{2}{3}x$



Directions: Use your knowledge of proportional relationships to answer the following questions. Show all work.

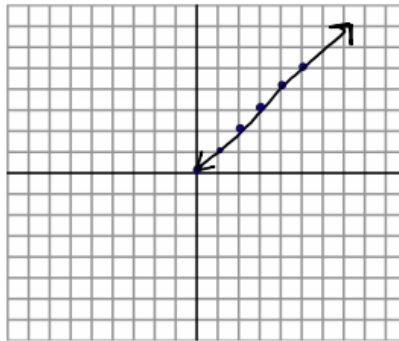
14) The price Betty paid for bananas can be represented using the equation $y = .75x$, the price Beth paid for bananas is represented in the table below and the price Kathy paid for bananas is represented in the graph below. Determine who paid the best price for bananas and explain how you know.

Betty:

Beth:

Pounds (x)	0	2	4	6	8
Cost \$ (y)	0	1	2	3	4

Kathy:



15) Allie is working to save money to buy a new sweater that costs \$40. Hanna is working to save money to buy the same sweater. Determine who will buy the sweater first and explain how you know.

Allie:

x (# hours worked)	1	2	3	4	5
y (total income)	8	16	24	32	40

Hanna:

