Get Ready for Honors 8th Grade Algebra I- Summer Work Instructions

It is important to keep your skills sharp to be ready for math this fall. This summer work is a review of the most important concepts you have learned this past year.

1. Print and complete these work pages.You must show all of your work! Bring them to your math teacher on or before September 19th. This work will be part of your first marking period grade.

2. Study all multiplication facts. You can use flashcards or online games to practice. You should know all facts 1-12 quickly and automatically.

X	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Unit 1 Practice

Name: _____

Expressions and Equations (Exponents) and the Number System

In this unit you learned to:	Lesson
simplify numerical expressions that include integer exponents, for example: $(5^8)(5^7) = 5^{15}$.	1
solve equations of the form $p = x^2$ and $p = x^3$.	2
evaluate square roots of perfect squares and cube roots of perfect cubes, for example: $\sqrt[3]{27} = 3$.	2
write the repeating decimal that is equivalent to a rational number and the fraction that is equivalent to a repeating decimal, for example: $0.\overline{3} = \frac{1}{3}$.	3
estimate the value of irrational numbers.	3
use scientific notation to express very large or very small quantities and to add, subtract, multiply, or divide with numbers expressed in scientific notation.	4, 5

Use these skills to solve problems 1–8.

1 Which numbers are rational? Select all that apply.

- **A** $1.\overline{45}$
- **B** $\sqrt{10}$
- **C** π
- **D** $\sqrt{49}$
- **E** 3.8
- **F** $\frac{13}{19}$

2 Which of these is equivalent to 3^2? Select all that apply.

- **A** $\frac{3^8}{3^4}$
- **B** $\frac{6^2}{2}$
- **C** $3^5 \cdot 3^3$
- **D** $3 \cdot 3$
- **E** $\frac{3^{12}}{3^{10}}$
- **F** $\frac{3^{-3}}{3^{-5}}$

3 Express $0.\overline{54}$ as a fraction.

_____

4 Which pair shows items that have the same value?

- **A** $\sqrt[3]{64}$ and $\sqrt{8}$
- **B** $\sqrt[3]{27}$ and $\sqrt{81}$
- **C** $\sqrt[3]{45}$ and $\sqrt{9}$
- **D** $\sqrt[3]{216}$ and $\sqrt{36}$

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Solve.

5 The volume of a cube is 125 cm^3. The area of a square is 64 cm^2. How does the length of one edge of the cube compare to the length of one side of the square? Explain.

_____

_____

_____

_____

_____

6 The surface area of a cube is 96 $in.^2$. What is the volume of the cube?

Show your work.

Solution: _____

_____

7 Use scientific notation to find 508,000,000,000 × 0.0000073. Write the answer in scientific notation and in standard form.

Show your work.

Solution: _____

8 Evaluate: $\frac{(3.5 \times 10^{13}) - (1.4 \times 10^{12})}{3 \times 10^{9}}$.

Write the answer in scientific notation and in standard form.

Show your work.

Solution: _____

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Unit 2 Practice

Name: _____

Functions

In this unit you learned to:	Lesson
explain what a function is.	6
compare properties of two functions, for example: compare rate of change of a function shown by a graph to the rate of change of a function shown by a table.	7
study the graph of a function and describe it as increasing or decreasing, linear or nonlinear.	8, 9, 10

Use these skills to solve problems 1–6.

1 Consider the values in the table.

x (input)	−2	−1	0	1	2
y (output)	4	1	0	1	4

a. Does the table represent a function? Explain.

_____

b. If you switched the input and output values, would the table represent a function? Explain.

_____

2 The equation $c = 50 + 35m$ shows the amount c that Dina paid for her health club membership after m months. The table shows the amount Judy paid for her health club membership.

Number of Months	0	1	2	3
Amount Judy Paid	$80	$105	$130	$155

Which statement is true? Select all that apply.

A Dina paid a higher amount to join the health club.

B Judy pays more per month to be a member.

C After 1 month, Judy has paid more than Dina.

D After 4 months, Dina has paid more than Judy.

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Solve.

3 Which function is linear? Select all that apply.

A $y = 3x - 2$

B $y = x^2 + 1$

C $y = 1.5 - 0.75x$

D $y = \frac{1}{3}x^3 - 2$

E $y = \frac{5}{x} + 5$

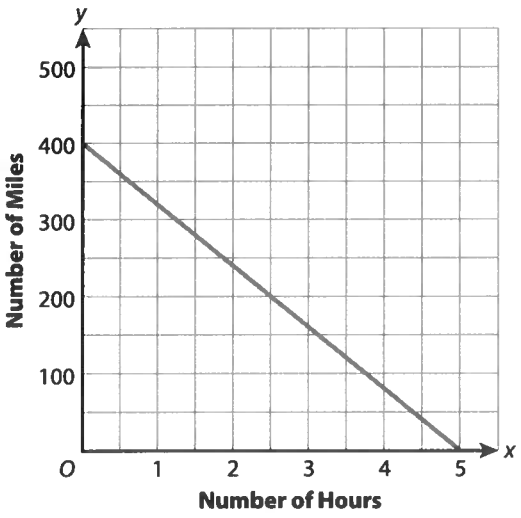
F $y = x + 2x$

4 The table shows a linear function.

x (input)	1	3	6
y (output)	5	11	20

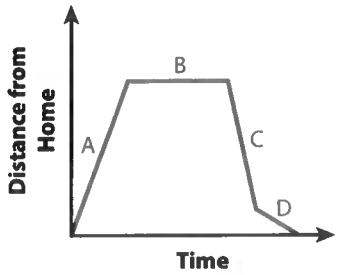
What are the slope and the y-intercept?

5 The graph shows the time and the distance a train is from its destination city as it travels between two cities.



Identify the slope and y-intercept and explain what each means in the context of the problem. Then write an equation for the line.

6 Jordan rode his bike to the park. The graph shows his distance from home on his trip.



Use the graph and describe what happened at each part of the trip.

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Unit 3 Practice

Name: _____

Expressions and Equations (Linear Equations)

In this unit you learned to:	Lesson
graph proportional relationships.	11
compare two different proportional relationships.	11
identify the slope of a proportional relationship.	12
graph the line represented by an equation of the form $y = mx$ or $y = mx + b$.	12
solve linear equations in one variable, for example: find y if $4(y + 3) = 3(3y - 1)$.	13
give an example of a linear equation that has no solution or many solutions.	14
solve systems of linear equations, for example: find x and y if $y = x - 20$ and $x + y = 84$.	15, 16, 17

Use these skills to solve problems 1–7.

1 The equation $y = 54x$ represents the distance, y, that a car travels in x hours. The table shows similar information for a bus.

Hours	2	4	7	9
Miles	113	226	395.5	508.5

Which vehicle traveled at a faster average rate? How much faster?

_____

_____

2 Three more than two-thirds of a number is the same as 1 less than twice the number. Let x be the number. Write and solve an equation to find x.

Show your work.

Solution: _____

3 Which of these is NOT a possible outcome when solving a system of linear equations?

A No solution

B 1 solution

C 2 solutions

D Infinite number of solutions

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Solve.

4 Look at the equation below. Tell whether each statement is *True* or *False*.

$4(x + 2) + 3x = 7(x + 1) + b$

a. If $b = 1$, the equation has an infinite number of solutions. ☐ True ☐ False

b. If $b = 5$, the equation has no solution. ☐ True ☐ False

c. If $b = x$, then the solution is $x = 1$. ☐ True ☐ False

5 A line goes through the points (3, 1) and (7, 7). Is the given point also on the line? Select *Yes* or *No*.

a.	(5, 4)	☐ Yes	☐ No
b.	(11, 13)	☐ Yes	☐ No
c.	(0, 0)	☐ Yes	☐ No
d.	(1, −2)	☐ Yes	☐ No

6 Connie has 20 coins, all of which are nickels or dimes. She has a total of $1.25. How many nickels does Connie have?

Show your work.

Solution: _____

7 Look at the system of equations below.

$ax + 3y = -5$

$2x - 6y = 10$

Part A

Find a value of a for which the system would have 1 solution. Justify your answer.

Show your work.

Part B

Find a value of a for which the system would have an infinite number of solutions. Justify your answer.

Show your work.

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Unit 4 Practice

Name: _____

Geometry

In this unit you learned to:	Lesson
demonstrate the properties of translations, rotations, and reflections.	18
give the new coordinates of a figure in the coordinate plane after a translation, rotation, or reflection.	19, 20
identify pairs of congruent angles when a transversal intersects parallel lines.	21
identify similar triangles based on angle measurements.	22
demonstrate why the sum of the angle measures in any triangle is 180°.	22
explain a proof of the Pythagorean Theorem.	23
apply the Pythagorean Theorem to solve problems.	24
find distance in the coordinate plane.	25
compare the volumes of cones, cylinders, and spheres.	26
apply volume formulas of cones, cylinders, and spheres to solve problems.	27

Use these skills to solve problems 1–6.

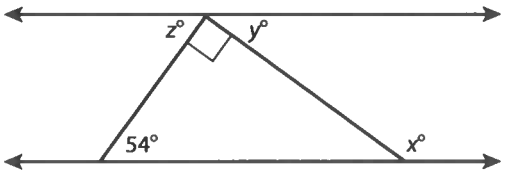
1 What is the image of the point (4, −1) after a reflection over the *x*-axis and a translation 6 units left and 2 units up?

A (−10, 1)
B (−2, 3)
C (6, −5)
D (10, 3)

2 A rectangle has a length that is 7 inches longer than its width. The length of a diagonal is 13 inches. What is the perimeter of the rectangle?

A 5 inches
B 12 inches
C 34 inches
D 40 inches

3 In the drawing below, the two horizontal lines are parallel.



What are the values of *x*, *y*, and *z*?

_____

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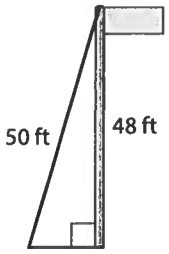
Solve.

4 A flagpole is 48 feet tall. A 50-foot-long support wire connects the top of the flagpole to a stake in the ground. How far from the base of the flagpole is the stake?

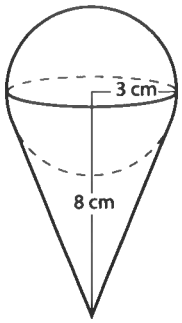


Show your work.

Solution: _____

_____

5 An ice cream cone is 8 cm tall and the radius of the opening is 3 cm. A scoop of ice cream is a sphere with a radius of 3 cm. If the entire scoop of ice cream melts into the cone, how much of the ice cream will spill over the cone? Use 3.14 for π.



Show your work.

Solution: _____

_____

6 A triangle has vertices at (1, 5), (5, 8), and (8, 4). Select whether each statement is *True* or *False*.

a.	The triangle is isosceles.	☐ True	☐ False
b.	The triangle is a right triangle.	☐ True	☐ False
c.	The perimeter of the triangle is 15 units.	☐ True	☐ False
d.	If the triangle is reflected over the *y*-axis, one of the answers to the first three statements will change.	☐ True	☐ False
e.	If the triangle is dilated by a factor of 2.5 and then translated 3 units right and 1 unit down, one of the answers to the first three statements will change.	☐ True	☐ False

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Unit 5 Practice

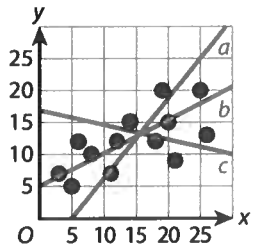
Name: _____

Statistics and Probability

In this unit you learned to:	Lesson
construct a scatter plot of bivariate data.	28
fit a trend line to a scatter plot.	29
interpret the slope and *y*-intercept of trend lines in scatter plots to solve problems.	30
display data in a two-way frequency table.	31
interpret a two-way frequency table to identify possible associations between two categorical variables.	31

Use these skills to solve problems 1–4.

1 The scatter plot shows the relationship between two variables. Which line appears to be the line of best fit?



A Line *a*

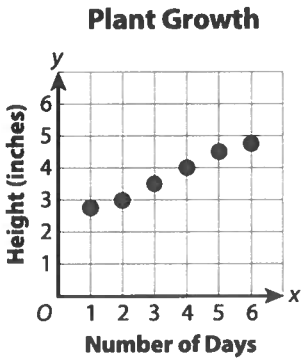
B Line *b*

C Line *c*

D The relationship is not linear.

2 Jayne collects data about the height of a plant in inches and days of growth. The graph shows the data and a line of best fit. Write an equation for the line of best fit. Then use your equation to predict the height of a plant after 13 days of growth.

Show your work.



Solution: _____

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Solve.

3 At a school, 150 students were asked whether they play a sport and whether they play an instrument. The table shows the results.

	Instrument	No Instrument	Total
Sport	25	45	70
No Sport	60	20	80
Total	85	65	150

Part A:

Suppose you want to determine if there is an association between playing an instrument and playing a sport. Complete the relative frequency table. Give each percent to the nearest tenth.

	Instrument	No Instrument
Sport		
No Sport		
Total		

Part B:

If a student plays an instrument, then how likely is he or she to play a sport? Explain.

Part C:

According to the data, is there an association between playing an instrument and playing a sport? Explain.

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