Algebra 1 Honors Prep Packet

Attached, you will find the basic learning targets from Pre-Algebra that you are expected to know **BEFORE** you start Honors Algebra 1. For each topic addressed, this packet contains review examples, properties, definitions, and video tutorial QR codes followed by practice problems. This material must be mastered in order for you to be successful in Honors Algebra 1. You will be assessed at the beginning of course on what is covered in this packet. Since this material is designed as a review, you are responsible for completing this packet on your own. The packet may be graded at the start of the school year to assess your knowledge and effort. Be sure to **SHOW ALL OF YOUR WORK and submit it at the start of class!**

Name: _____

Target Checklist

Target 1: Arithmetic Properties

- ☐ Order of Operations
- ☐ Arithmetic Properties
- ☐ Distributive Property
- ☐ Properties of Real Numbers
- ☐ Exponents
- ☐ Square Roots

Target 2: Factors and Multiples

- ☐ Factors and Multiples
- ☐ Prime and Composite Numbers
- ☐ Prime Factorization
- ☐ Least Common Multiple (LCM)
- ☐ Greatest Common Factor (GCF)

Target 3: Reading and Interpreting Data

- ☐ Stem and Leaf Plots
- ☐ Picture Graphs, Bar Graphs, and Dot Plots
- ☐ Frequency Tables and Histograms
- ☐ Number Patterns

Target 4: Measurement

- ☐ Area of Rectangles and Triangles
- ☐ Perimeter
- ☐ Volume of a Rectangular Prism
- ☐ Converting between measurements (imperial and metric) *Chem

Target 5: Fractions

- ☐ Fractions Intro
- ☐ Fractions on the Number Line
- ☐ Equivalent Fractions
- ☐ Comparing Fractions
- ☐ Common Denominators
- ☐ Adding and Subtracting Fractions (Word Problems)
- ☐ Multiplying Whole Numbers and Fractions
- ☐ Multiplication as Scaling

- ☐ Multiplying and Dividing Fractions
- ☐ Multiplying Mixed Numbers
- ☐ Converting Fractions to Decimals
- ☐ Percents

Target 6: Decimals

- ☐ Rounding Decimals
- ☐ Converting Decimals to Fractions to Percents
- ☐ Consumer Math Problems

Target 7: Ratio, Rates, Proportions, and Scientific Notation

- ☐ Unit Rates
- ☐ Cross Multiplication
- ☐ Solving Proportions to scale problems
- ☐ Putting Numbers in Scientific Notation

Target 8: Equations and Expressions

- ☐ Evaluating Expressions
- ☐ Solving 1-Step Equations
- ☐ Solving 2-Step and Multi-Step Equations

Target 1: Arithmetic Properties

□ Order of Operations (PEMDAS)

Directions: Simplify each expression using the Order of Operations

1. $12 - [(8 + 7) \cdot 2] \div 6$
2. $7 + 54 \div 3(2)$
3. $24 - 4^2 \cdot 3 + 15$
4. $\frac{(7-2^2)+17}{-14+2\cdot 5}$
5. $|-7| + (53 - 3^4) \div \sqrt{16}$
6. $2 \cdot 3^2 + (-4)^2 - 3| - 5|$

□ Arithmetic Properties

Commutative Property of Addition or Multiplication
Associative Property of Addition or Multiplication
Identity Property of Addition or Multiplication
Distributive Property
Inverse Property of Addition or Multiplication
Zero Property

Directions: Define the Properties used in the examples below.

1. $4 + (x + y) = (4 + x) + y$ _____
2. $2(x + 6) = 2x + 12$ _____
3. $(2y) \cdot 1 = 2y$ _____
4. $(m + n) + 3 = (n + m) + 3$ _____
5. $(6 - x) \cdot 0 = 0$ _____
6. What is the additive inverse of 14? _____
7. What is the multiplicative inverse of $\frac{2}{3}$? _____

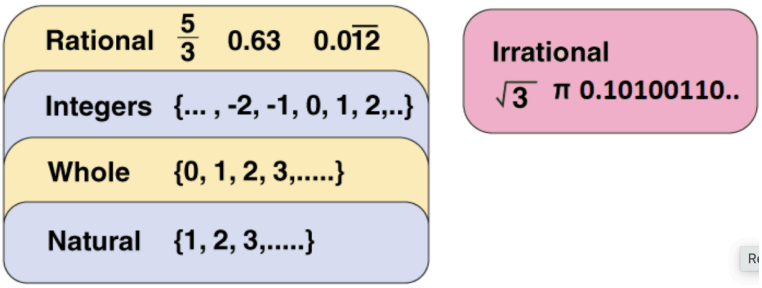
□ Distributive Property

Use the distributive property to simplify the following expressions:

1. $-6(x-5) =$ _____ 2. $\frac{1}{2}(2x-4) =$ _____

3. $2x(y+3z) =$ _____ 4. $2(3x-7)-4(x-1) =$ _____

□ Properties of Real Numbers



Directions: Name the Subsets of Real Numbers each number belongs to:

-7 : _____ ⅔ : _____

π : _____ .3333 : _____

$\sqrt{21}$: _____ $\overline{.1}$: _____

1 : _____ 0 : _____

□ Exponents

Directions: Expand the following expressions then evaluate.

$12^2 \rightarrow$ ____ · ____ = _____

$(-3)^3 \rightarrow$ ____ · ____ · ____ = _____

$(-2)^2 \rightarrow$ ____ · ____ = _____

$-2^2 \rightarrow$ ____ · ____ = _____

□ Square Roots

Directions: Evaluate the following expressions. Round to the nearest hundredth if necessary.

$\sqrt{9}$ **=** _____ Is 9 a perfect square? Yes or No

$-\sqrt{25}$: _____ Is 25 a perfect square? Yes or No

$\sqrt{2}$: _____ Is 2 a perfect square? Yes or No

$-\sqrt{10}$: _____ Is 10 a perfect square? Yes or No

Target 2: Factors and Multiples

☐ **Factors and Multiples**

Factors: numbers that divide evenly into a given number.

Directions: Find the factors of each.

1) 32:_____

2) 52:_____

3) 116:_____

4) 256:_____

Multiples: count by the given number.

Directions: Write the next 4 multiples of the following numbers.

5) 7: _____

6) 17: _____

7) 6: _____

☐ **Prime Number: a number that only has factors of 1 and itself.**
☐ **Composite Number: a number that has more than 2 factors.**

Directions: Prove that following numbers are prime or composite by showing how it can be factored. Circle prime or composite.

8) 27 : _____ prime or composite

9) 31 : _____ prime or composite

10) 59 : _____ prime or composite

11) 117 : _____ prime or composite

☐ **Prime Factorization: breaking down a number using only prime numbers.**

Scan or Click

Directions: Find the prime factorization for the following numbers:

12) 48
/ \

13) 105
/ \

48 : _____

105 : _____

14) 94
/ \

15) 360
/ \

94 : _____

360 : _____

☐ **Least Common Multiple (LCM): The smallest number that a is a multiple of both (or all) numbers:**

Directions: Find the LCM:

16) 12 and 18 : _____

17) 14 and 16 : _____

18) 6, 8, and 10 : _____

☐ **Greatest Common Factor (GCF): the largest number that divides evenly into both (or all) numbers:**

Directions: Find the GCF:

19) 16 and 18 : _____

20) 24 and 40 : _____

21) 27, 33, and 51 : _____

Target 3: Reading and Interpreting Data

Directions: Read each and answer each question using the graphs provided.

☐ Stem and Leaf Plots

Plant Heights

Stem	Leaf
0	1 2 4 5 6 8 9
1	0 1 1 5 7
2	2 5
3	6

Key: 1 | 5 = 15 inches

Scan or Click

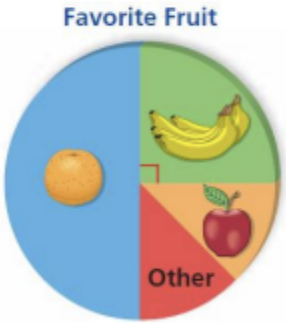
1. What is the mean plant height? Round to the nearest integer. _____

2. What is the median plant height? _____

3. What is the range? _____

4. What is the mode? _____

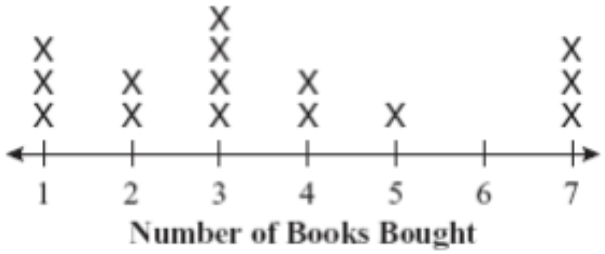
☐ Picture Graphs, Bar Graphs, and Line Plots



5. The circle graph above shows the results of a survey on favorite fruit. If the survey included 80 students, how many students chose bananas as their favorite?

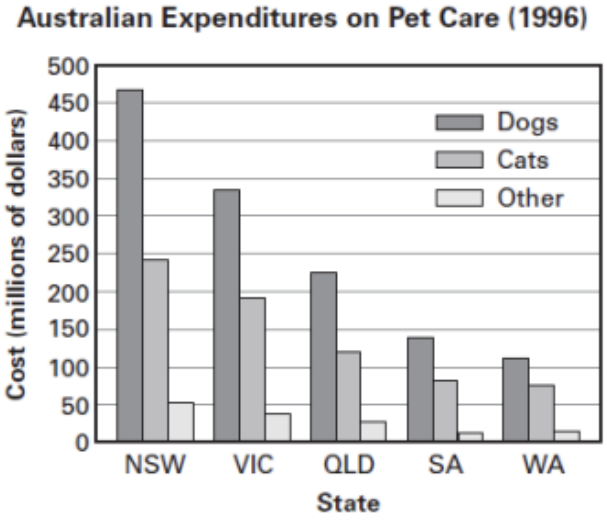
_____

The line plot below shows the number of books individual customers bought at a bookstore one day.



6. What was the total number of customers who bought more than 3 books? _____

7. How many customers bought 1-3 books? _____



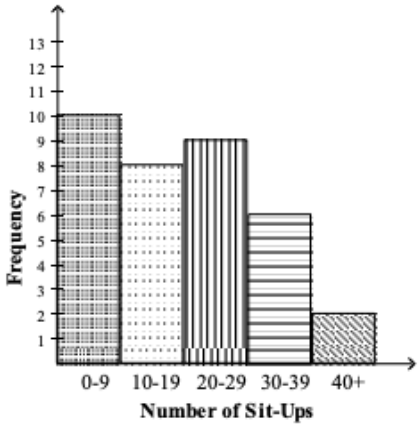
8. Which state has the highest total spending on dog care? _____

9. Which state spent approximately $150 million on cat and other expenditures? _____

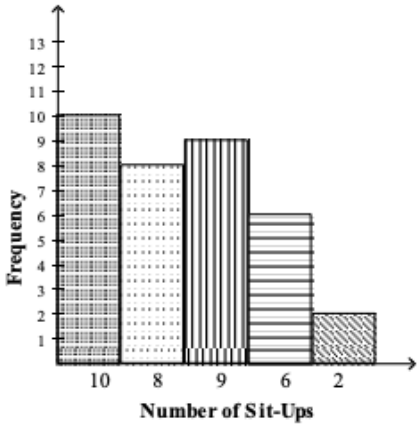
☐ Frequency Tables and Histograms

Number of Sit-ups Students Can Do in 1 Minute					
Number	0 – 9	10 – 19	20 – 29	30 – 39	40 +
Frequency	10	8	9	6	2

A)



B)



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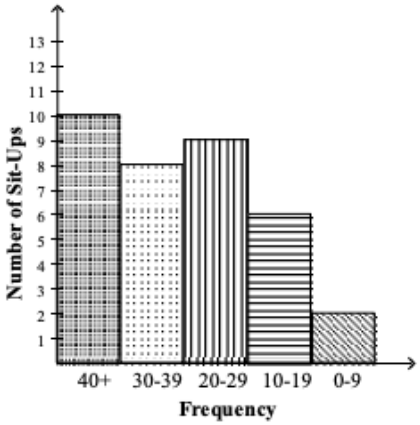
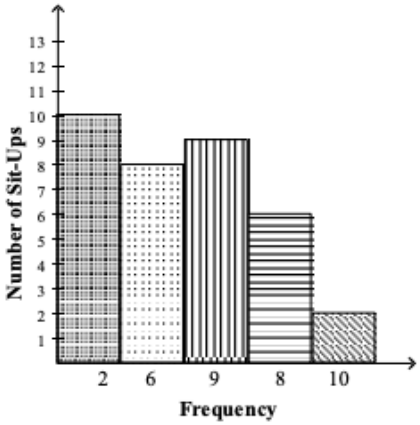


D)

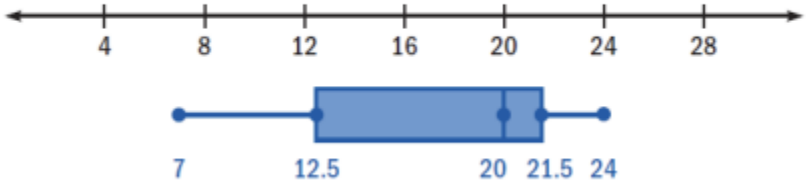


10. Which Histogram represents the frequency table? _____

11. What interval has the most amount of students? _____

12. How many students can do 30-39 sit-ups in a minute? _____

☐ Box-and-Whisker Plots and Number Patterns



13. What is the Minimum? _____

14. What is the Maximum? _____

15. What is the Median? _____

16. What is Q1? _____

17. What is Q3? _____

18. What is the IQR? _____

19. What number is missing in the pattern?
12, 16, _____, 24, 28.

20. What is the next ordered pair in the pattern?
(10, 5) , (8, 4) , (6, 3) , (4, 2) , _____.

Target 4: Measurement

□ Area of Rectangles and Triangles

Scan or Click

Area is measure in square units (m^2, ft^2, in^2, $etc.$)

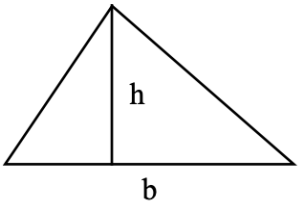
Square

$A = s^2$

Rectangle

$A = l \cdot w$

Triangle



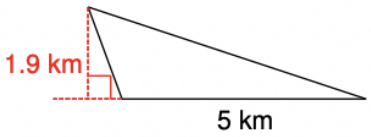
$A = \frac{1}{2} b \cdot h$

Directions: Find the area of the given figures below. INCLUDE UNITS:

1.

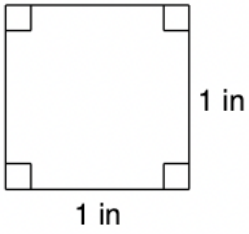
Area:_____

2.



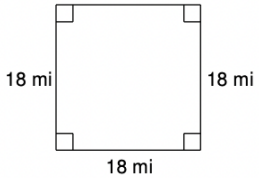
Area:_____

3.

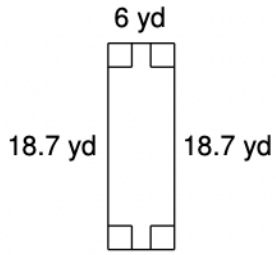


Area:_____

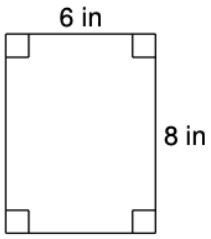
4.



Area:_____

5. 

Area:_____

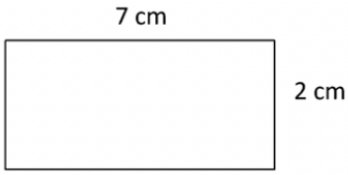
6. 

Area:_____

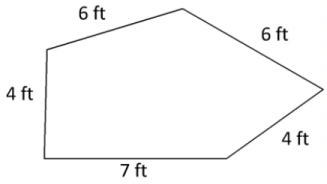
□ Perimeter

Add up all of the side lengths in each figure (units are measured in the same units).

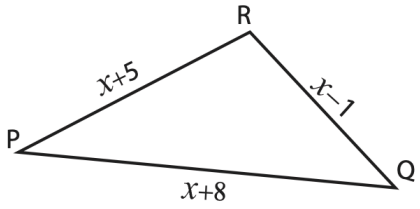
Directions: Find the perimeter of the figures below. INCLUDE UNITS:

7. 

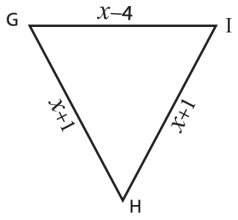
Perimeter = _____ cm

8. 

Perimeter = _____ ft

9. 

Perimeter = _____

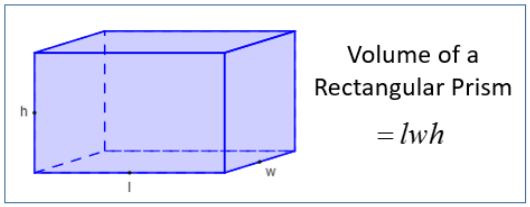
10. 

Perimeter = _____

Scan or Click

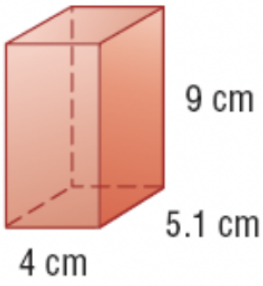
□ Volume of a Rectangular Prism

Refer to the diagram below for finding the volume of a Rectangular Prism:



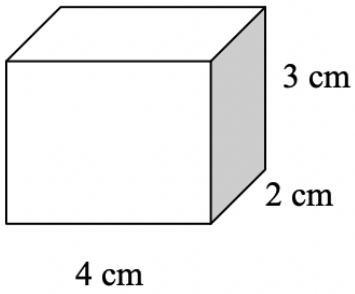
Directions: Find volume. Volume is measured in cubic units (m^3, ft^3, in^3, $etc.$)

16)



Volume:_____

17)



Volume:_____

☐ Converting between measurements (Imperial and Metric)

US Customary System (Imperial)

Distance	12 inches = 1 foot 5280 feet = 1 mile 3 feet = 1 yard
Fluid Volume	8 fl. oz = 1 cup 2 cups = 1 pint 2 pints = 1 quart 4 quarts = 1 gallon
Weight	16 oz = 1 pound 2000 lbs = 1 ton
Time	60 seconds = 1 min 60 min = 1 hour 24 hours = 1 day 7 days = 1 week 365 days = 1 year

Metric System

Distance	1 meter = 100 centimeters 1 centimeter = 10 millimeters 1 kilometer = 1000 meters
Fluid Volume	1 liter = 1000 milliliters
Weight	1 kilogram = 1000 grams

Directions: Convert each measurement into the given unit

18) 2 mi = _____ ft

19) 100 yd = _____ in

20) 256 cups = _____ gal

21) 2 days = _____ seconds

22) 2.5 tons = _____ lbs

23) 600 oz = _____ lbs

24) 550 m = _____ cm

25) 1.68 L = _____ ml

Target 5: Fractions

Directions: Answer each question. All final answers should be fully simplified

□ Fractions Intro

1. What is .4 in simplified fraction form? _____

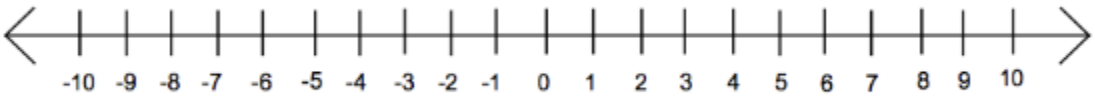
2. What is 1.25 in simplified mixed number form? _____

3. What is 2.5 in simplified improper fraction form? _____

□ Fractions on the Number Line

4. Use the number line below to plot and label the following numbers:

$\frac{1}{2}$, $\frac{3}{2}$, $-1\frac{3}{4}$, $\frac{7}{2}$, $-\frac{22}{4}$, $-\frac{2}{3}$



□ Equivalent Fractions

Directions: Fill in the blank to make equivalent fractions.

5. $\frac{3}{2} = \frac{\quad}{12}$ 6. $\frac{2}{3} = \frac{\quad}{15}$ 7. $\frac{6}{4} = \frac{\quad}{10}$

□ Comparing Fractions

Directions: Use a $<$ or $>$ to compare the fractions.

8. $\frac{3}{2}$ ___ $\frac{22}{12}$ 9. $-\frac{2}{3}$ ___ $-\frac{3}{4}$ 10. $\frac{8}{9}$ ___ $\frac{7}{8}$

□ Common Denominators

11. What is the least common denominator of $\frac{1}{7}$ and $\frac{2}{3}$? _____

12. What is the least common denominator of $\frac{2}{5}$ and $\frac{8}{9}$? _____

□ Adding and Subtracting Fractions (Word Problems - No Calc!)

13. A pizza is covered with multiple toppings. $\frac{1}{3}$ of the pizza is covered in mushrooms, $\frac{1}{8}$ of the pizza is covered with onions, and the rest of the pizza is covered with only cheese. What fraction of the pizza is covered with only cheese?

14. Tucker baked $2\frac{1}{7}$ pizzas and ordered another $\frac{5}{7}$ of a pizza from his local pizzeria. If he shares $1\frac{3}{8}$ of his pizza with his friends, how much pizza does he have left over?

□ Multiplying Whole Numbers and Fractions (No Calc!)

15. $(\frac{3}{4})(5)$ = _____ 16. $(\frac{2}{3})(12)$ = _____

□ Multiplying and Dividing Fractions (No Calc!)


17. $(\frac{1}{4})(\frac{3}{8})$ = _____ 18. $(\frac{2}{3})(\frac{4}{7})$ = _____

19. $\frac{3}{4} \div \frac{2}{3}$ = _____ 20. $\frac{1}{3} \div \frac{2}{7}$ = _____

□ Multiplying and Dividing Mixed Numbers (No Calc!)


21. $(1\frac{1}{4})(2\frac{2}{5})$ = _____ 22. $(2\frac{2}{3})(3\frac{4}{7})$ = _____

23. $2\frac{3}{4} \div 1\frac{2}{3}$ = _____ 24. $4\frac{1}{3} \div 1\frac{2}{7}$ = _____

☐ Converting Fractions to Decimals

25. What is $\frac{2}{5}$ in decimal form? _____

26. What is $\frac{1}{3}$ in decimal form? _____

☐ Percents

27. What is .06 in percent form? _____

28 . What is 2.3 in percent form? _____

29 . What is $\frac{3}{5}$ in percent form? _____

30 . What is $1\frac{3}{4}$ in percent form? _____

Target 6: Decimals

☐ Rounding Decimals

1) Round 1,540.865 to the nearest tenth: _____

2) Round 182.899 to the nearest hundredth: _____

☐ Converting Decimals to Percentages

3) Convert 0.05 to a percent: _____

4) Convert 0.0125 to a percent: _____

5) Convert 2.60 to a percent: _____

☐ Consumer Math Problems

6) A pair of shoes that sells for $79 is discounted 15%. How much money was saved?

7) A store produces a jacket for $65 but sells it at $70.20. What is the percent mark-up?

8) Jenny and her friends go to dinner. Their bill was $60.50. They want to leave a 20% tip. How much money should they leave?

9) Using the formula I = Prt, find how much interest you would make on an account that invests $2000 at a rate of 5.5% for 6 years.

Target 7: Ratio, Rates, Proportions, and Scientific Notation

☐ Unit Rates

Directions: Answer each question and show your work.

1. A skydiver falls 144 feet in three seconds. How far does the skydiver fall per second?

2. It costs $3.99 for 25 fl. oz. of detergent or $6.99 for 90 fl. oz. Which is a better buy?

3. A 16 oz package of brown rice costs 79 cents and a 32 oz package of white rice costs $3.49. Which package is a better deal?

☐ Cross Multiplication

4. $\frac{b}{9} = \frac{10}{3}$

5. $\frac{7}{5} = \frac{6}{n}$

6. $\frac{9}{6} = \frac{a}{10}$

7. $\frac{4x}{8} = \frac{6}{2}$

☐ Solving Proportions to scale problems

8. A model plane has a scale of 1 in : 6 yd. If the model plane is 3 in tall then how tall is the real plane in yards? *Hint draw a picture to help*

9. If a 6 ft tall tent casts a 10 ft long shadow then how long is the shadow of a pole that is 9 ft tall? *Hint draw a picture to help*

10. A telephone booth that is 8 feet tall casts a shadow that is 4 feet. If a nearby flagpole is 14 ft tall then how long is its shadow? *Hint draw a picture to help*

☐ Putting Numbers in Scientific Notation

11. What is 340,000 in Scientific Notation? _____

12. What is 0.00056 in Scientific Notation? _____

13. What is 45,320,000 in Scientific Notation? _____

14. What is 0.0000023 in Scientific Notation? _____

Target 8: Equations and Expressions

☐ Evaluating Expressions

Directions: Evaluate each expression.

1. $\frac{10-x}{2}$ when x = -6

2. $x^2 + x$ when x = -2

3. 6y - 5x when x = 2 and y = -1

4. $|x - y| - y^2$ when x = 1 a d y = -3

☐ Solving 1-Step Equations

1. Solve for x: x − 3 = −5

2. Solve for y: 0.9 = y + 2.8

3. Solve for m: $m - (-\frac{2}{5}) = \frac{3}{5}$

4. Solve for n: $\frac{n}{5} = -3$

5. Solve for z: $1.3z = 5.2$

6. Solve for t: $\frac{3}{5}t = 6$

☐ Solving 2-Step and Multi-Step Equations

1. Solve for x: 2x + 5 = 19

2. Solve for y: $\frac{y}{3} - 1 = 5$

3. Solve for a: $3(a + 1) = 16$

4. Solve for x: $1.25x - 4.2 = 10.75$