

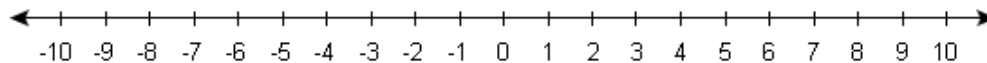
Name: _____ (2014-2015)

Math 7 Honors/Math 8 Summer Packet

- This packet is designed to help you retain the information you learned in Advanced Math 6 or Math 7 and realize what skills are essential for you to have as you enter Math 7 Honors or Math 8.
- The packet **will not be collected by your teacher**, this is only for your practice and to keep your math skills fresh as you enjoy some time off from school this summer. Should you need to review or get assistance please try your online textbook <http://www.bigideasmath.com> or other helpful math sites like <https://www.khanacademy.org/math/cc-seventh-grade-math>.
- The most important topics to review for next year are **INTEGERS** (know your rules!) and **ALGEBRA**.
- Use websites and online games to help you strengthen your multiplication table skills! It is expected that you know **ALL** your multiplication tables (0 through 12) by heart!

	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

Topic: Integers



Examples:

Addition	Subtraction	Multiplication	Division
<i>Same signs: Add & keep sign</i> $+6 + +5 = +11$ $(-8) + (-2) = -10$	<i>Keep-Change-Opposite</i> $(+10) - (-8) = (+10) + (+8) = 18$ $(-5) - (+12) = (-5) + (-12) = -17$	<i>Same signs: Positive product</i> $(+7)(+8) = 56$ $(-2)(-6) = 12$	<i>Same signs: Positive quotient</i> $+42 \div +6 = 7$ $(-24) \div (-8) = 3$
<i>Different signs: Subtract & take sign of larger value</i> $+9 + -5 = +4$ $(-6) + +1 = -5$	$(-20) - (-8) = (-20) + (+8) = -12$	<i>Different signs: Negative product</i> $(3)(-9) = -27$ $(-5)(4) = -20$	<i>Different signs: Negative quotient</i> $56 \div (-7) = -8$ $(-50) \div 2 = -25$

Recall the **order of operations**:

- 1 - **P**arentheses (or grouping symbols)
- 2 - **E**xponents
- 3 - **M**ultiplication and/or **D**ivision (left to right)
- 4 - **A**ddition and/or **S**ubtraction (left to right)

1) $(-12) + (-7) = \underline{\hspace{2cm}}$

2) $(-25) + 18 = \underline{\hspace{2cm}}$

3) $2 + (-25) = \underline{\hspace{2cm}}$

4) $(-28) - (-8) = \underline{\hspace{2cm}}$

5) $11 - (-5) = \underline{\hspace{2cm}}$

6) $(-21) - 4 = \underline{\hspace{2cm}}$

7) $(-9)(-8) = \underline{\hspace{2cm}}$

8) $(2)(-12) = \underline{\hspace{2cm}}$

9) $(-35) \div (-7) = \underline{\hspace{2cm}}$

10) $(-48) \div (8) = \underline{\hspace{2cm}}$

11) $(-2)(6)(-5) = \underline{\hspace{2cm}}$

12) $(-30) + 24 \div 6 \bullet (-2) = \underline{\hspace{2cm}}$

13) $16 \div 4 + 2 \bullet (-8) = \underline{\hspace{2cm}}$

14) $-3(1-8) + 2^3 = \underline{\hspace{2cm}}$

**** Practice your INTEGER RULES using websites and online games!! You MUST know these!! ****
(ex. www.math.com or www.mathguide.com/lessons/Integers.html)

Scientific Notation

A number written as a number that is at least 1, but less than 10 multiplied by a power of 10.

Ex. $7.16 \times 10^5 = 716,000$ (in standard form)

$9.2 \times 10^{-3} = 0.0092$ (in standard form)

Write each of the following in standard form.

15) 8.2×10^5

16) 2.45×10^{-4}

17) 7.28×10^3

18) 9.1×10^{-2}

Answers:

15) _____

16) _____

17) _____

18) _____

Write each of the following in scientific notation.

19) 25,900

20) 0.039

21) 0.0007

22) 3,207,000,000

19) _____

20) _____

21) _____

22) _____

Rounding

Rounding a numerical value means replacing it by another value that is approximately equal but has a shorter, simpler, or more explicit representation. We round numbers to a specific place value. **UNDERLINE** the place value you're rounding to. Then check the place to the right and decide whether to keep it the same or round up.

Round each of the following decimals to the **nearest tenth**. Write your answer on the blank.

23) 87.46 _____

24) 8.862 _____

25) 13.4395 _____

26) 654.839 _____

27) 23.648 _____

28) 32.971 _____

Round each of the following decimals to the **nearest hundredth**. Write your answer on the blank.

29) 26.879 _____

30) 429.76492 _____

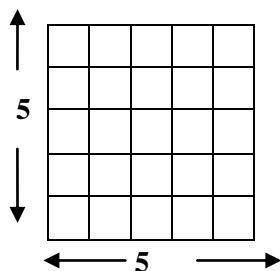
31) 675.495132 _____

32) 3.8961 _____

Topic: Square roots

The square of 5 is 25.

$$5 \cdot 5 = 5^2 = 25$$



The square root of 25 is 5 because $5 \cdot 5 = 25$ OR $5^2 = 25$.

The square of an integer is called a **perfect square**. The **square root** of a perfect square is an integer.

Complete the t-chart below. **MEMORIZE these perfect squares!**

square root of a perfect square	integer value
$\sqrt{1}$	
$\sqrt{4}$	
$\sqrt{9}$	
$\sqrt{16}$	
$\sqrt{25}$	
$\sqrt{36}$	
$\sqrt{49}$	
$\sqrt{64}$	
$\sqrt{81}$	
$\sqrt{100}$	
$\sqrt{121}$	
$\sqrt{144}$	
$\sqrt{169}$	
$\sqrt{196}$	
$\sqrt{225}$	

To **approximate** square roots that are not perfect squares, determine the **perfect squares** which the radicand lies between.

Example: To approximate $\sqrt{32}$, think of the perfect squares 32 is between (25 and 36).

$$\sqrt{25} < \sqrt{32} < \sqrt{36}$$

$$5 < \sqrt{32} < 6 \text{ therefore, } \sqrt{32} \text{ is between 5 and 6.}$$

(Because 32 is closer to 36 than 25, we may estimate that $\sqrt{32} \approx 5.7$.)

Find each square root. DO NOT USE A CALCULATOR.

1) $\sqrt{16} =$ _____ 2) $\sqrt{36} =$ _____ 3) $\sqrt{121} =$ _____

4) $\sqrt{225} =$ _____ 5) $\sqrt{169} =$ _____ 6) $\sqrt{81} =$ _____

State which integers the square root lies between. DO NOT USE A CALCULATOR!!

Ex: $\sqrt{81} < \sqrt{85} < \sqrt{100}$ therefore $\sqrt{85}$ is between the integers 9 and 10.

7) _____ $< \sqrt{37} <$ _____ therefore $\sqrt{37}$ is between the integers _____ and _____.

8) _____ $< \sqrt{26} <$ _____ therefore $\sqrt{26}$ is between the integers _____ and _____.

9) _____ $< \sqrt{61} <$ _____ therefore $\sqrt{61}$ is between the integers _____ and _____.

10) _____ $< \sqrt{119} <$ _____ therefore $\sqrt{119}$ is between the integers _____ and _____.

11) _____ $< \sqrt{68} <$ _____ therefore $\sqrt{68}$ is between the integers _____ and _____.

12) _____ $< \sqrt{50} <$ _____ therefore $\sqrt{50}$ is between the integers _____ and _____.

13) _____ $< \sqrt{40} <$ _____ therefore $\sqrt{40}$ is between the integers _____ and _____.

14) _____ $< \sqrt{18} <$ _____ therefore $\sqrt{18}$ is between the integers _____ and _____.

15) _____ $< \sqrt{32} <$ _____ therefore $\sqrt{32}$ is between the integers _____ and _____.

Topic: Algebra

Combining like terms and applying the Distributive Property

In algebraic expressions, **like terms** are terms that contain the same variables raised to the same power. Only the **coefficients** of like terms may be different.

In order to **combine like terms**, we add or subtract the numerical coefficients of the like terms using the Distributive Property: $ax + bx = (a + b)x$

- Examples:
- 1) $2x + 9x = (2 + 9)x = 11x$
 - 2) $12y - 7y = (12 - 7)y = 5y$
 - 3) $5x + 8 - 2x + 7 = (5x - 2x) + (8 + 7) = 3x + 15$

Here, the like terms are: $5x$ and $-2x$ which simplifies to $3x$ and $8 + 7$ which is equal to 15.

The **Distributive Property** of multiplication over addition/subtraction is frequently used in Algebra:

- Examples:
- 1) $7(2x + 9) = 7 \cdot 2x + 7 \cdot 9 = 14x + 63$
 - 2) $4(6 - 5x) = (4) \cdot (6) - (4) \cdot (5x) = 24 - 20x$

Simplify each expression by combining like terms.

Answers:

- 1) $8y + 2y =$ 1. _____
- 2) $10 - 6y + 4y + 9 =$ 2. _____
- 3) $3x + 7 - 2x =$ 3. _____
- 4) $8n - 7y - 12n + 5 - 3y =$ 4. _____

Apply the distributive property and write your answer in simplest form.

- 5) $7(x - 4) =$ 5. _____
- 6) $5(4n - 3) =$ 6. _____
- 7) $-6(3y + 5) =$ 7. _____
- 8) $-4(8 - 9x) =$ 8. _____
- 9) $8(3n + 7) =$ 9. _____
- 10) $-4(5 + 7y) =$ 10. _____

Topic: Algebra

Solving equations by using the Addition, Subtraction or Multiplication Property of Equality. Check the solution.

Ex 1: $x - 6 = 10$

$$+6 = +6$$

$$x = 16$$

Check: $x - 6 = 10$

$$16 - 6 = 10$$

$$10 = 10$$

:

Ex 2: $\frac{x}{2} + 5 = 9$

$$- 5 = -5$$

$$\frac{2}{1} \cdot \frac{x}{2} = 4 \cdot 2$$

$$x = 8$$

Check: $\frac{x}{2} + 5 = 9$

$$\frac{8}{2} + 5 = 9$$

$$4 + 5 = 9$$

$$9 = 9$$

Translate and evaluate the following equations.

Ex 3: The product of 4 and a number is 28.

$$4 \cdot n = 28$$

$$\frac{4n}{4} = \frac{28}{4}$$

$$n = 7$$

Ex 4: The quotient of a number and 3 is 15.

$$\frac{n}{3} = 15$$

$$n = 45$$

Key words:

Addition: sum, more than, increased by

Subtraction: difference, less than

Multiplication: product

Division: quotient

Solve the following equations. Show your work and check your solution.

1) $2x = 18$

2) $\frac{x}{3} = -12$

3) $x + 8 = -12$

Check:

Check:

Check:

4) $x + 8 = 32$

5) $\frac{x}{4} = 20$

6) $x - 7 = 8$

Check:

Check:

Check:

7) $3x - 5 = 7$

8) $6x + 3 = -15$

9) $\frac{x}{4} + 8 = 20$

Check:

Check:

Check:

Translate each sentence to an algebraic equation. Then use mental math to find the solution.

	<i>Equation</i>	<i>Solution</i>
10. One-half of a number is -12 .	_____	_____
11. 6 more than 7 times a number is 41.	_____	_____
12. 5 less than three times a number is 10.	_____	_____
13. 16 increased by twice a number is -24 .	_____	_____

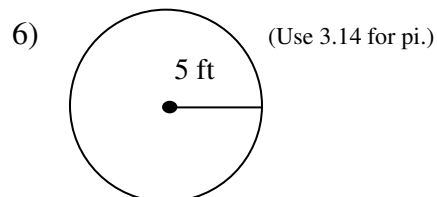
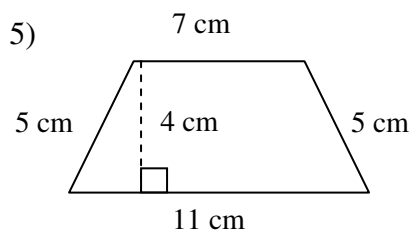
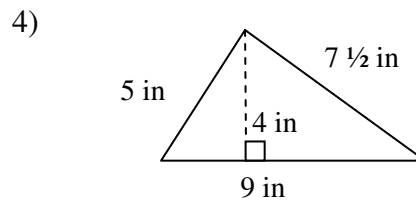
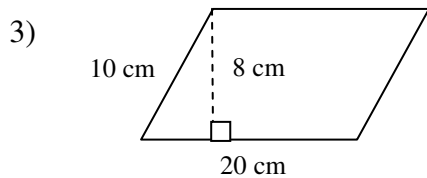
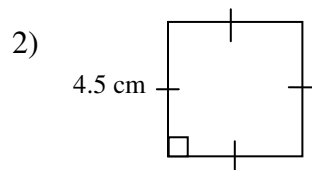
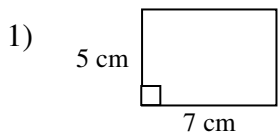
Topic: Geometry

You should know the following formulas and be able to use them to find the area or perimeter of a geometric figure.

Perimeter of a polygon = the sum of the sides

Rectangle:	$P = 2l + 2w$	$A = lw$
Square:	$P = 4s$	$A = s^2$
Parallelogram:	$P = s_1 + s_2 + s_3 + s_4$	$A = bh$
Triangle:	$P = s_1 + s_2 + s_3$	$A = \frac{1}{2}bh$
Trapezoid:	$P = s_1 + s_2 + s_3 + s_4$	$A = \frac{1}{2}(b_1 + b_2)h$
Circle:	Circumference = πd	$A = \pi r^2$

Find the perimeter and area of each figure. Use $\pi \approx 3.14$ and show your work.



ANSWERS

Integers

1. -19
2. -17
3. -23
4. -20
5. 16
6. -25
7. 72
8. -24
9. 5
10. -6
11. 60
12. -38
13. -12
14. 29

Scientific Notation

15. 820,000
16. 0.00024
17. 7,280
18. 0.091
19. 2.59×10^4
20. 3.9×10^{-2}
21. 7.0×10^{-4}
22. 3.2×10^9

Rounding

23. 87.5
24. 8.9
25. 13.4
26. 654.8
27. 23.6
28. 33.0
29. 26.88
30. 429.67
31. 675.50
32. 3.90

Square Roots

Chart integer values

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

1. 4
2. 6
3. 11
4. 15
5. 13
6. 9
7. $\sqrt{36}$ & $\sqrt{49}$, 6 & 7
8. $\sqrt{25}$ & $\sqrt{36}$, 5 & 6
9. $\sqrt{49}$ & $\sqrt{64}$, 7 & 8
10. $\sqrt{100}$ & $\sqrt{121}$, 10 & 11
11. $\sqrt{64}$ & $\sqrt{81}$, 8 & 9
12. $\sqrt{49}$ & $\sqrt{64}$, 7 & 8
13. $\sqrt{36}$ & $\sqrt{49}$, 6 & 7
14. $\sqrt{16}$ & $\sqrt{25}$, 4 & 5
15. $\sqrt{25}$ & $\sqrt{36}$, 5 & 6

Distributive Property

1. $10y$
2. $19-2y$
3. $x + 7$
4. $-4n - 10y + 5$
5. $7x - 28$
6. $20n - 15$
7. $-18y - 30$
8. $-32 + 36x$
9. $24n + 56$
10. $-20 - 28y$

Solving Equations

1. $x = 9$
2. $x = -36$
3. $x = -20$
4. $x = 24$
5. $x = 80$
6. $x = 15$
7. $x = 4$
8. $x = -3$
9. $x = 48$

Translate and solve

10. $\frac{1}{2}x = -12$ $x = -24$
11. $6 + 7x = 41$ $x = 5$
12. $3x - 5 = 0$ $x = 5$
13. $16 + 2x = -12$ $x = -14$

Geometry

1. $P = 60\text{cm}$
 $A = 35\text{ cm}^2$
2. $P = 180\text{ cm}$
 $A = 20.25\text{ cm}^2$
3. $P = 60\text{ cm}$
 $A = 160\text{ cm}^2$
4. $P = 21.5\text{ in}$
 $A = 18\text{ in}^2$
5. $P = 28\text{cm}$
 $A = 36\text{ cm}^2$
6. $P = 31.4\text{ ft}$
 $A = 78.5\text{ ft}^2$