New Heights Charter School of Brockton

Algebra I Packet

March/April 2020

March 2020

Dear New Heights Charter School Scholars,

Thank you for taking time to complete this Algebra I packet. It is important to refine skills in academic areas during periods of absence from school. Scholars should work through this packet and complete as much work as possible. A reference sheet is located at the end of the packet, and a reference sheet is available as an attachment.

Submit this completed packet to your math teacher. As a reminder, the work completed in this packet will not count towards your grades, and it is considered academic enrichment.

Sincerely,

Ms. Miceli
Director of Curriculum

Proportions

Write and solve a proportion to answer each problem. Show your work.

1. Tommy types 54 words per minute, with an average of 3 mistakes. How many mistakes would you expect Tommy to make if he typed 300 words ?

2. Jackie burns 250 calories per hour doing aerobics. She has to burn 3500 calories to lose one pound. How long will Jackie have to work out to lose 5 pounds?

Percent

The items below were purchased in a city with a sales tax rate of 5%. Find the amount of sales tax on each purchase.

1. A DVD for $18.00

2. A computer hard drive for $140.00

3. A bathing suit for $65.00

4. A bicycle for $150.00

Table of Values

Plot each point in the table on a coordinate grid. Identify the rate of change for each.

1.

X	-3	-2	-1	0	1	2	3
Y	15	13	11	9	7	5	3

For each equation, create a table of values and plot the points. Identify the rate of change.

2. $y = x + 4$

X	-2	-1	0	1	2
y					

3. $y = 2x - 6$

X	Y
-2	
-1	
0	
1	
2	

Adding and Subtracting Integers

Simplify each expression

1. $-2 + (-3)$ **2.** $8 - 7 + 4$ **3.** $8 + (-5)$

4. $15 + (-3)$ **5.** $-16 + 8$ **6.** $7 + (-10)$

7. $-9 + (-5)$ **8.** $-12 + 14$ **9.** $8 + 7$

10. $-63 - 89$ **11.** $-12 - (-21)$ **12.** $92 - (-16)$

13. $72 - 15$ **14.** $-86 - (-19)$ **15.** $17 - (-46)$

16. $-78 - (-53)$ **17.** $-19 - (-12)$ **18.** $-16 - (-21)$

19. $27 - 19$ **20.** $-14 - 27$

Order of Operations - Integers

Accentuate the Negative

Find the value of each expression.

1. $(8 + 2) \times 9$ **2.** $5 - 1 \div 4$ **3.** $(6 + 3) \div 18$ **4.** $80 - 6 \times 7$

5. $4 \times 6 + 3$ **6.** $4 \times (6 + 3)$ **7.** $35 - 6 \times 5$ **8.** $8 \div 3 + 6$

9. $(-4)^2 + 10 \cdot 2$ **10.** $-4^2 + 10 \cdot 2$ **11.** $(5 \cdot 3)^2 + 8$

12. $5 \cdot 3^2 + 8$ **13.** $9 + (7 - 4)^2$ **14.** $-9 + 7 - 4^2$

15. $(-6)^2 + 3^3 - 7$ **16.** $-6^2 + 3^3 - 7$ **17.** $2^3 + (8 - 5) \cdot 4 - 5^2$

18. $(2^3 + 8) - 5 \cdot 4 - 5^2$ **19.** $2^3 \cdot 3 - 5 \cdot 5^2 + 8$ **20.** $2^3 \cdot 3 - 5(5^2 + 8)$

Multiplying and Dividing Rational Numbers

Accentuate the Negative

Use the algorithms you developed to find each value.

1. $-\frac{1}{6} \cdot 2\frac{3}{4}$

2. $\frac{3}{16} \div \left(-\frac{1}{8}\right)$

3. $-\frac{31}{56} \cdot (-8)$

4. $-5\frac{7}{12} \div 12$

5. $-8 \div \frac{1}{4}$

6. $-3\frac{1}{6} \div \left(-2\frac{1}{12}\right)$

7. $8\frac{3}{4} \cdot 3\frac{7}{8}$

8. $-\frac{11}{12} \div \frac{5}{6}$

9. $4\frac{9}{28} \cdot (-7)$

10. $-1\frac{1}{15} \div 15$

11. $-3 \div \frac{3}{4}$

12. $-2\frac{7}{8} \div 3\frac{3}{4}$

13. $-\frac{23}{24} \cdot (-8)$

14. $\frac{7}{8} \cdot \left(-\frac{2}{7}\right)$

15. $-7 \div \frac{1}{9}$

Adding and Subtracting Rational Numbers

Accentuate the Negative

Find each sum or difference as a mixed number or fraction in simplest form.

1. $\frac{3}{4} + \frac{7}{8}$

2. $-1\frac{1}{6} + 2\frac{2}{3}$

3. $4\frac{1}{2} - 7\frac{7}{8}$

4. $-3\frac{5}{6} - \left(4\frac{1}{12}\right)$

5. $\frac{5}{18} + \frac{7}{12}$

6. $-4\frac{7}{20} + 3\frac{9}{10}$

7. $5\frac{8}{21} - \left(-3\frac{1}{7}\right)$

8. $1\frac{19}{24} + 2\frac{23}{20}$

9. $3\frac{16}{25} - 4\frac{7}{20}$

Write each answer as a fraction or mixed number in simplest form.

10. $14.6 + \left(-3\frac{1}{5}\right)$

11. $-7\frac{3}{4} + 4.125$

12. $5.75 + \left(-2\frac{1}{8}\right)$

Operations with Rational Numbers

13. $(-2)(8)$

14. $(-6)(-9)$

15. $(-3)^4$

16. -2^5

17. $(6)(-8)$

18. $(-14)^2$

19. $2(-4)(-6)$

20. $-30 \div (-5)$

21. $\frac{-52}{-13}$

22. $(-8)(5)(-3)$

23. -7^2

24. -3^5

25. $\frac{-68}{17}$

26. $\frac{(-4)(-13)}{-26}$

27. $\frac{225}{(-3)(-5)}$

28. $2^4 - 3^2 + 5^2$

29. $(-8)^2 - 4^3$

30. $32 \div (-7 + 5)^3$

31. $\frac{3}{4} \div \left(-\frac{3}{7}\right)$

32. $18 + 4^2 \div (-8)$

33. $26 \div [4-(-9)]$

© Pearson Education, Inc., publishing as Pearson Prentice Hall. All rights reserved.

Fractions - Word Problems

1. Suppose you have $2\frac{1}{2}$ oranges. If a student serving consists of $\frac{3}{4}$ an orange, how many student servings (including parts of a serving) can you make?

2. Pat is also tying ribbons into bows. Pat sees the same $7\frac{1}{2}$ feet of ribbon measured out and says "Since my bows are bigger than Carmen's, there is only enough for me to make $2\frac{1}{4}$ bows." How much ribbon does Pat use on each bow?

Evaluating Expressions

For Exercises 1–26, evaluate the expression for the given value of x.

1. $3.5x - 10$ when $x = 2$

2. $45 - 2x$ when $x = 6$

3. $-3 - x$ when $x = \frac{1}{2}$

4. $4x + 9$ when $x = 11$

5. $2x^2$ when $x = 8$

6. $11 - 3x^2$ when $x = 1$

7. $4.5 + x^2$ when $x = 1.5$

8. $6x^2 + 13$ when $x = -10$

9. $6x^2 + x - 11$ when $x = 2$

10. $6x^2 + x - 11$ when $x = -2$

11. $12 - 2x^2 + 5x$ when $x = -4$

12. $12 - 2x^2 + 5x$ when $x = 4$

13. $x(31 - x)$ when $x = 3$

14. $(x + 5)(x - 1)$ when $x = 0$

15. $(x - 1.5)(x + 42)$ when $x = 1.5$

16. $(31 - x)x$ when $x = -3$

17. $\frac{36}{x^2}$ when $x = -6$

18. $\frac{x^2}{24}(x + 7)$ when $x = -7$

19. $42(x + 1)$ when $x = 4$

20. $\frac{3(16 - x)}{2x}$ when $x = 10$

21. $\frac{x}{4} + 6(x - 12)$ when $x = 12$

22. $7x(3 + x)$ when $x = -4$

23. $7x^2 - x + 10$ when $x = 2$

24. $8x - 2x(6 - x)$ when $x = 0$

25. $0.5x^2 + x - 20$ when $x = 10$

26. $(x + 7)(x - 2)$ when $x = -5$

Distributive Property

1. x–7=3

Say It With Symbols

Use the Distributive Property to write each expression in expanded form.

1. $2(x + 6)$ **2.** $-5(8 - b)$ **3.** $4(-x + 7)$

4. $-\frac{3}{4}(12 - 16d)$ **5.** $\frac{2}{3}(6h - 1)$ **6.** $(-3.2x + 2.1)(-6)$

7. $3.5(3x - 8)$ **8.** $4(x + 7)$ **9.** $-2.5(2a - 4)$

10. $\frac{2}{3}(12 - 15d)$ **11.** $-2(k - 11)$ **12.** $-\frac{1}{3}(6h + 15)$

113

Solving Equations

Solve each equation. Show your work and check your solution.

1. X-7 = 3

2. X+2 = 11

3. 2= - 4z

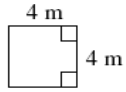
4. -36 = 93

Area Review – Show all work

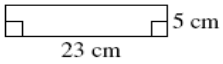
Filling and Wrapping

Find the area of each figure.

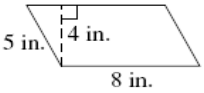
1.



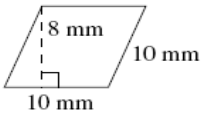
2.



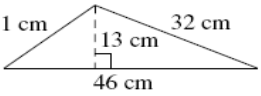
3.



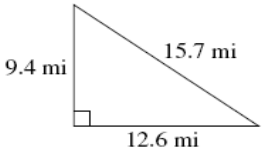
4.



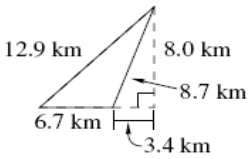
5.



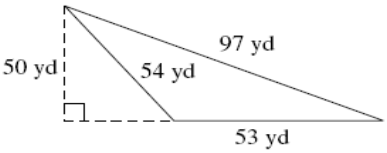
6.



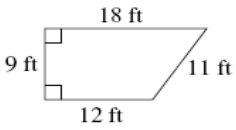
7.



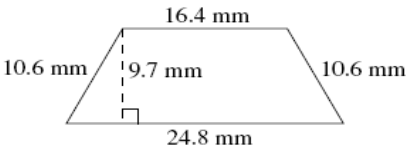
8.



9.

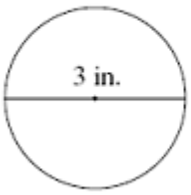


10.

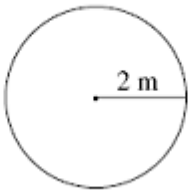


Find the **circumference** and the **area** of each circle.

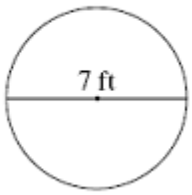
11.



12.



13.

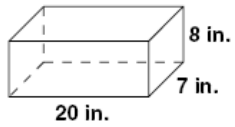


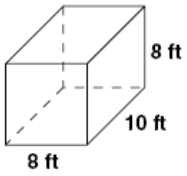
Surface Area and Volume

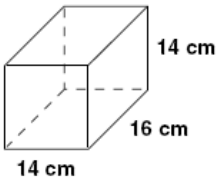
Find the Surface Area and Volume of each rectangular prism.

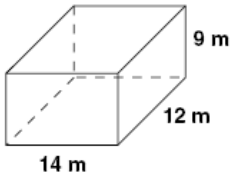
Filling and Wrapping

Find the volume of each closed box.

1. 

2. 

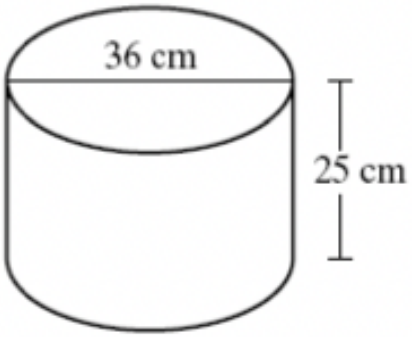
3. 

4. 

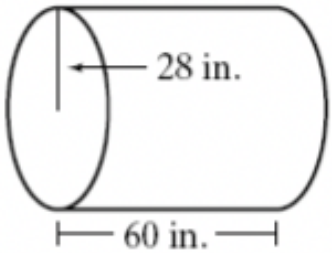
Volume of cylinders

Find the volume of each cylinder. Write the formula and show all work.

1.



2.



3. A water storage tank has a cylindrical shape. The base has a diameter of 18 meters and the tank is 32 meters high. How much water, to the nearest cubic unit, can the tank hold?

4. A cylindrical juice container is 9 inches tall and has a radius of 2 inches. What is the volume of the container to the nearest whole unit?

Simplify.

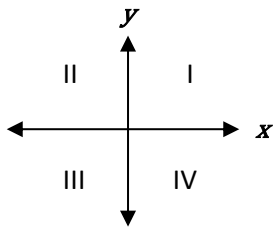
Working with Exponents

1) 15^0	2) $(2^{-3})\,(3)^3$
2) 5^{-2}	4) $(3^2)\,(3^{-5})$
Evaluate and write your answer in scientific notation. 5) $\frac{6.25\times10^{-4}}{1.25\times10^{2}}$	

MCAS Approved Supplemental Mathematics Reference Sheet

(***ONLY*** for students who have this accommodation listed in their IEP or 504 plan)

General Problem-Solving Strategies	Properties
• Reread the question for clarity • Circle or highlight key terms • Calculate and solve • Circle my answer • See if my answer makes sense	• $a \cdot (b + c) = a \cdot b + a \cdot c$ • $a + (b + c) = (a + b) + c$ • $a \cdot (b \cdot c) = (a \cdot b) \cdot c$ • $a + b = b + a$ • $a \cdot b = b \cdot a$
Geometry and Measurement Abbreviations	**Symbols**
• $l = length$ • $w = width$ • $h = height$ • $s = length\ of\ a\ side$ • $b = length\ of\ the\ base$ • $r = radius$ • $d = diameter$ • $A = area$ • $B = area\ of\ the\ base$ • $P = perimeter$ • $C = circumference$ • $M = midpoint$	• $<$ *is less than* • $>$ *is greater than* • $=$ *is equal to* • $\lvert$ *absolute value* $\rvert$ • $\leq$ *is less than or equal to* • $\geq$ *is greater than or equal to* • $\neq$ *is not equal to* • $\approx$ *is approximately equal to* • $\cong$ *is congruent to* • $\sim$ *is similar to* • $\parallel$ *is parallel to* • $\perp$ *is perpendicular to*
General Formulas	**Coordinate Plane**
• $\pi \approx 3.14$ • $a^2 + b^2 = c^2$ • $d = rt$ $\quad distance = rate \cdot time$ • $I = prt$ $\quad Interest = principal \cdot rate \cdot time$ • $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	• $Ax + By = C$ • $m = \frac{y_2 - y_1}{x_2 - x_1}$ • $y = mx + b$ • $y - y_1 = m(x - x_1)$ • M: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ • $d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$



Fractions

- $\frac{a}{b}+\frac{c}{d}=\frac{ad+bc}{bd}$
- $\frac{a}{b}-\frac{c}{d}=\frac{ad-bc}{bd}$
- $\frac{a}{b}\cdot\frac{c}{d}=\frac{ac}{bd}$
- $\frac{a}{b}\div\frac{c}{d}=\frac{ad}{bc}$

Statistics

- me**A**n
- me**DI**an
- **MO**de
- **R**ang**E**

Probability

- $P=\frac{favorable\ outcomes}{possible\ outcomes}$

Percentages and Proportions

- $\frac{is}{of}=\frac{\%}{100}$
- if $\frac{a}{b}=\frac{c}{d}$, then $ad=bc$

Transformations

- tran**SL**ation
- re**FL**ection
- ro**T**ation

Vocabulary

- $factor\cdot factor=product$
- $dividend\div divisor=quotient$
- $\frac{numerator}{denominator}$

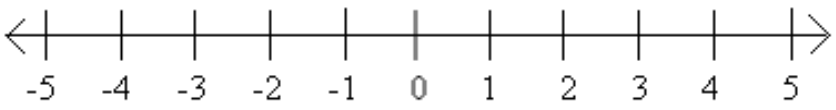
Divisibility Rules

2	If the last digit is even
3	If the sum of the digits can be divided by 3
5	If the last digit is 0 or 5
6	If the number is divisible by both 2 and 3
9	If the sum of the digits can be divided by 9
10	If the last digit is 0

Angles

- Complementary 90
- Supplementary 180

Mnemonics and Devices

- PEMDAS
- FOIL

Number Line