

8th Grade Summer Math Review Packet



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Massachusetts Comprehensive Assessment System Grade 7 Mathematics Reference Sheet

CONVERSIONS

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon \approx 3.785 liters

1 liter \approx 0.264 gallon

1 liter = 1000 cubic centimeters

1 inch = 2.54 centimeters

1 meter \approx 39.37 inches

1 mile = 5280 feet

1 mile = 1760 yards

1 mile \approx 1.609 kilometers

1 kilometer \approx 0.62 mile

1 pound = 16 ounces

1 pound \approx 0.454 kilogram

1 kilogram \approx 2.2 pounds

1 ton = 2000 pounds

AREA (A) FORMULAS

square $A = s^2$

rectangle $A = bh$

OR

$A = lw$

parallelogram $A = bh$

triangle $A = \frac{1}{2}bh$

trapezoid $A = \frac{1}{2}h(b_1 + b_2)$

circle $A = \pi r^2$

CIRCLE FORMULAS

area $A = \pi r^2$

circumference $C = 2\pi r$

OR

$C = \pi d$

VOLUME (V) FORMULAS

cube $V = s^3$

(s = length of an edge)

right prism $V = Bh$

TOTAL SURFACE AREA (SA) FORMULAS

right rectangular prism $SA = 2(lw) + 2(hw) + 2(lh)$

sphere $SA = 4\pi r^2$

Dear Rising 8th Graders,

We would like to wish you all a happy summer and congratulate you on finishing a successful year in 7th grade! You are expected to complete both parts, listed below, during your summer vacation.

Part One: Summer Math Packet

- You will be assessed on this material during the first full week of school. Results of this assessment will help inform intervention placement.
- Calculators will not be allowed during this assessment. **Please do not use a calculator on this packet, except to check your work.**
- The goal of this assignment is not to “get it done as fast as possible”. The purpose is to make sure you don’t forget all that you have learned this past year. Please pace yourself. **Don’t try to complete the assignment all at once. Similarly, don’t put it off until the last week in August.**

To help you pace yourself, we are asking that you and your parent/guardian keep track of your work. Try your best to complete **one topic per week**. We understand that it is summer, and that this might not be possible every week. Please use the chart on the back of this page to keep track of the work you do this summer. We will collect this form when we collect your work in September. Do your best at pacing yourself, and be honest in reporting how you complete your work.

Part Two: iReady

- Please sign on to iReady (login.i-ready.com) and complete and pass 5 lessons over the summer.
- Your username is first initial last initial lunch code (ex. John Smith would be JS99999 if his lunch code was 99999) and your password is collins (all lowercase).
- If you do not have internet access at home, computers are available at the CMS and Salem Public Libraries.

We look forward to working with you all next year. We hope that this assignment will help you to retain your math skills so that you will be prepared to learn in September. Please feel free to email kathryneaton@salemk12.org or ashleysilvey@salemk12.org with any questions or for specific help. Khan Academy (khanacademy.org) is another great resource if you need a refresher.

Sincerely,

8th Grade Math Team

8th Grade Summer Math Review

Packet

Please complete this chart as you complete the assignments. You may complete assignments in any order as long as you stay on track to finish by the beginning of September.

Assignment	Parent/Guardian Signature	Date Completed
Topic One: Adding and Subtracting Integers		
Topic Two: Multiplying and Dividing Integers		
Topic Three: Fraction Operations		
Topic Four: Order of Operations		
Topic Five: Solving One-Step Equations		
Topic Six: Solving Two-Step Equations		
Topic Seven: Area and Perimeter		
Topic Eight: Fraction – Decimal – Percent Conversions		
Topic Nine: Proportions		
Topic Ten: Word Problems		

iReady

Lesson Name/Topic	Parent/Guardian Signature	Date Completed

Estimados Alumnos Entrantes al 8vo Grado,

Nos gustaría desearles a todos un feliz verano y felicitarlos por haber terminado un exitoso año en el 7mo grado! Se espera que completen ambas partes, enumeradas a continuación, durante sus vacaciones de verano.

Primera Parte: Paquete de Matemáticas de Verano

- Serás evaluado sobre este material durante la primera semana completa de la escuela. Los resultados de esta evaluación ayudarán a informar sobre la colocación en clases de intervención.
- Las calculadoras no serán permitidas durante esta evaluación. Por favor no utilices una calculadora en este paquete, excepto para comprobar tu trabajo.
- El objetivo de esta asignación no es “hacerlo lo más rápido posible”. El propósito es asegurarse de que no olvides todo lo que has aprendido este año. Por favor toma tu tiempo. No trates de completar la asignación de una vez. Del mismo modo, no lo posponga hasta la última semana de agosto.

Para ayudarte a tomar tu tiempo, te pedimos a tí y a tus padres/guardián que lleven un registro de tu trabajo. Intenta lo mejor que puedas de completar un tema por semana. Entendemos que es verano, y que tal vez no sea posible cada semana. Por favor utiliza la table al otro lado de esta página para realizar un seguimiento del trabajo que haces este verano. Recogeremos este formulario cuando recopilemos tu trabajo en septiembre. Haz lo mejor que puedas para tomar tu tiempo, y se honesto al reportar como completas tu trabajo.

Segunda Parte: *iReady*

- Por favor inicia la sesión en *iReady* (login.i-ready.com) y completa y pasa 5 lecciones durante el verano.
- Tu nombre de usuario es tu primera inicial segunda inicial código del almuerzo (ej. John Smith sería JS99999 si su código de almuerzo es 99999) y tu contraseña es collins (todo en minúsculas).
- Si no tienes acceso al internet en tu casa, las computadoras están disponible en la biblioteca de Collins y la biblioteca pública de Salem.

Esperamos trabajar con contigo el próximo año. Esperamos que esta asignación te ayude a retener tus habilidades de matemáticas para que estés preparado para aprender en septiembre. Por favor no dude en mandar un correo electrónico a kathryneaton@salemk12.org o ashleysilvey@salemk12.org con cualquier pregunta o para ayuda específica. *Khan Academy* (khanacademy.org) es otro gran recurso si necesitas refrecar la mente.

Atentamente,

Equipo de Matemáticas del 8^{vo} Grado

Revisión de Matemáticas de Verano del 8^{vo} Grado

Paquete

Por favor completa esta tabla mientras completas las asignaciones. Puedes completar las asignaciones en cualquier orden, siempre y cuando te mantengas en camino para terminar a principios de septiembre.

Asignación	Firma del Padre/Guardian	Fecha Completa
Tema Uno: Sumando y Restando Números Enteros		
Tema Dos: Multiplicando y Dividiendo Números Enteros		
Tema Tres: Operaciones sobre Fracciones		
Tema Cuatro: Orden de Operaciones		
Tema Cinco: Solución de Ecuaciones en un Solo Paso		
Tema Seis: Solución de Ecuaciones de Dos Pasos		
Tema Siete: Area y Perímetro		
Tema Ocho: Fracciones - Decimales - Conversiones de Porcentajes		
Tema Nueve: Proporciones		
Tema Diez: Problemas Escritos		

iReady

Nombre de la Lección/Tema	Firma del Padre/Guardian	Fecha Completa

TOPIC ONE: ADDING AND SUBTRACTING INTEGERS

Instructions: Find the Sum or Difference **without using a calculator**. Calculators will not be allowed on the assessment in September. If you do your work on a separate sheet of paper, please staple that sheet to this worksheet.

1. $9 + -4$	2. $-1 + -6$
3. $2 + -6$	4. $-14 + -7$
5. $5 + -10$	6. $13 - 12$
7. $12 + -4$	8. $-14 + 22$
9. $-45 + -67$	10. $-13 + -4$
11. $35 + -53$	12. $15 + -8$

13. $7 + -7$	14. $9 - (-1)$
15. $5 - 8$	16. $-10 - (-8)$
17. $11 - (-25)$	18. $6 - 9$
19. $-28 - (-28)$	20. $-16 - (-2)$
21. $27 - 52$	22. $19 - (-12)$
23. $10 - (-14)$	24. $-36 - 29$
25. $42+ - 65$	26. $- 27 + 52$

TOPIC TWO: MULTIPLYING AND DIVIDING INTEGERS

Review:

To multiply and divide two integers, multiply or divide the numbers then decide the sign:

- If the signs are the same, the product is positive
- If the signs are different, the product is negative

Instructions: Find the product or quotient **without using a calculator**. Calculators will not be allowed on the assessment in the fall. If you do work on a separate sheet of paper, please staple that sheet to this worksheet.

1. $-3 \cdot 6$	2. $-6 \cdot (-9)$
3. $-50 \div 5$	4. $-32 \div 4$
5. $-7 \cdot 0$	6. $-18 \div (-6)$
7. $6 \cdot (-7)$	8. $-45 \div 9$

9. $-3 \cdot (-4)$	10. $-5 \cdot 2$
11. $-12 \div (-3)$	12. $14 \div (-7)$
13. $600 \div (-30)$	14. $3 \cdot (-15)$
15. $-2 \cdot (-8)$	16. $-0.4 \div (-1)$
17. $-28 \div (-7)$	18. $-7 \cdot 2 \cdot (-3)$
19. $-8 \cdot (-80)$	20. $-6 \cdot \frac{1}{3}$

TOPIC THREE: FRACTION OPERATIONS

Review:

Addition or Subtraction

1. Find the least common denominator (LCD)
2. Write each fraction with the common denominator
3. Add or subtract the numerators, keep the denominator
4. Simplify your answer if possible

Add $\frac{1}{3} + \frac{3}{7}$.

The least common denominator is 21.

$$\begin{aligned}\frac{1}{3} + \frac{3}{7} &= \frac{1 \cdot 7}{3 \cdot 7} + \frac{3 \cdot 3}{7 \cdot 3} \\ &= \frac{7}{21} + \frac{9}{21} \\ &= \frac{16}{21}\end{aligned}$$

Multiplication

1. Multiply the numerators
2. Multiply the denominators
3. Simplify your answer if possible

Multiply $\frac{1}{4} \cdot \frac{5}{6}$.

$$\begin{aligned}\frac{1}{4} \cdot \frac{5}{6} &= \frac{1 \cdot 5}{4 \cdot 6} \\ &= \frac{5}{24}\end{aligned}$$

Division

1. Multiply by the reciprocal of the second fraction
2. Simplify your answer if possible

Divide $\frac{3}{4} \div \frac{5}{7}$.

$$\begin{aligned}\frac{3}{4} \div \frac{5}{7} &= \frac{3}{4} \cdot \frac{7}{5} \\ &= \frac{3 \cdot 7}{4 \cdot 5} \\ &= \frac{21}{20}\end{aligned}$$

Instructions: Simplify the following fractions.

1. $\frac{12}{45}$	2. $\frac{20}{15}$
3. $\frac{42}{64}$	4. $\frac{25}{80}$
5. $\frac{15}{75}$	6. $\frac{60}{24}$
7. $\frac{32}{12}$	8. $\frac{18}{51}$

Instructions: Perform the indicated operation. Write your answer as a fraction or improper fraction in simplest form. Show all work. If you do work on a separate sheet of paper, please staple that sheet to this worksheet.

1. $\frac{6}{7} - \frac{1}{2}$	2. $\frac{15}{4} + \frac{9}{5}$
3. $\frac{2}{5} - \frac{1}{3}$	4. $5\frac{1}{10} - 2\frac{1}{3}$
5. $\frac{3}{5} \cdot \frac{5}{6}$	6. $4\frac{1}{4} \cdot 1\frac{2}{3}$
7. $\frac{2}{3} \div \frac{4}{7}$	8. $(4\frac{1}{3} - 2\frac{3}{4}) \cdot 1\frac{1}{2}$

TOPIC FOUR: ORDER OF OPERATIONS

Review:

When you have an expression that contains several operations, you use the order of operations to know which operation must be completed first.

- P Parentheses
- E Exponents/Square Roots
- MD Multiplication and Division (from left to right)
- AS Addition and Subtraction (from left to right)

Example:

$$8 \div (3 + -5)^2 =$$

$$8 \div (-2)^2 =$$

$$8 \div 4 =$$

$$4$$

Instructions: Show all work. Do not use a calculator. If you do work on a separate sheet of paper, please staple that sheet to this worksheet.

1. $8 \div 3^4$	2. $800 \div 2^4 + 50$
3. $6(7^2 - 2^3)$	4. $5^3 + 56 \div 7$
5. $(26 - 17)^2 + 35$	6. $80 \div (20 \div 10)^2$

7. $(5 \cdot 3)^2 - 75$	8. $-15 + 4^3$
9. $-9^2 - (-30)$	10. $3^4 + 40 - (5 - 3)^2$
11. $12^1 \cdot 30 - 8^2$	12. $6^2 - 50 \cdot 3^2$
13. $(14 + 5^2) \cdot 0$	14. $23 + (9 - 14)^2$
15. $(14 - 16)^3 + 10$	16. $-4 \cdot (2 - 8)^2$
17. $(-7 - 8)^2 \cdot 20$	18. $-15 \div 3 \cdot (-12)$

TOPIC FIVE: SOLVING ONE-STEP EQUATIONS

Review:

There are five types of one-step equations that we have learned to solve. In all cases, the goal is to “undo” whatever operation has been performed in order to isolate the variable.

Addition equations: To solve, we subtract from both sides what was added to x.

$$\begin{array}{r} x + 7 = -12 \\ -7 \quad -7 \\ \hline x = -19 \end{array}$$

Subtraction equations: To solve, we add to both sides what was subtracted from x.

$$\begin{array}{r} x - 8 = 10 \\ +8 \quad +8 \\ \hline x = 18 \end{array}$$

Multiplication equations: To solve, divide both sides by what multiplied x.

$$\begin{array}{r} 5x = -25 \\ \hline 5 \quad 5 \\ \hline x = -5 \end{array}$$

Division equations: To solve, multiply both sides by what divided x.

$$\begin{array}{r} 3 \cdot \frac{x}{3} = -7 \cdot 3 \\ \hline x = -21 \end{array}$$

Fractional equations: To solve, multiply both sides by the reciprocal of the fraction that multiplies x.

$$\begin{array}{r} \frac{3}{2} \cdot \frac{2}{3} x = 16 \cdot \frac{3}{2} \\ \hline x = \frac{48}{2} \\ \hline x = 24 \end{array}$$

Instructions: Solve each equation by undoing what has been done to the variable.

1. $b + 15 = 8$	2. $\frac{d}{5} = -10$
3. $z - 20 = 32$	4. $6p = -30$
5. $-8 = 12 + q$	6. $\frac{h}{4} = -7$
7. $-49 = -7x$	8. $t - 9 = -19$
9. $\frac{3}{4}x = -6$	10. $5 = \frac{5}{6}x$

TOPIC SIX: TWO-STEP EQUATIONS

Review:

The goal of solving two- step equations is to isolate the variable on one side of the equal sign. To do this you first need to undo addition or subtraction, and then undo multiplication or division.

Solve each equation. Then check your solution.

Example:

$$3x + 1 = 10$$

$$\begin{array}{r} -1 \quad -1 \\ \hline \end{array} \quad \text{(subtract 1 from both sides)}$$

$$\underline{3x} = \underline{9} \quad \text{(re-write new equation)}$$

$$\begin{array}{r} 3 \quad 3 \\ \hline \end{array} \quad \text{(to isolate x, divide both sides by 3)}$$

$$x = 3$$

To check the solution, substitute the value of x into the original equation.

When $x = 3$,

$$3(3) + 1 = 10$$

$$9 + 1 = 10$$

$$10 = 10 \quad \checkmark$$

Your answer is correct when both sides of the equation equal each other.

Instructions: Solve each equations. Then check your solution by substituting it into the original equation (*like the example above*).

1. $-8 + 2t = 4$	2. $-3 - 5n = -1$
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$$3. 7 = -2 + 3b$$

$$4. 2x + 8 = -6$$

$$5. -15 - 3v = 6$$

$$6. 16 = 4s - 8$$

$$7. -2 = 10d - 3$$

$$8. \frac{h}{-3} - 6 = 8$$

$$9. 9 - \frac{m}{4} = -12$$

$$10. \frac{k}{5} + 11 = -4$$

TOPIC SEVEN: AREA AND PERIMETER

Review: The **perimeter** of a shape is the sum of the lengths of its sides. To find the perimeter, add the lengths of the figure's sides. Remember to always write units - your answer should never be just a number.

The **area** of a shape is the amount of space it takes up. Use the formula sheet included in this review packet to help you.

Instructions:

1. Draw each figure.
2. Find the perimeter of the figure. Show all work.
3. Find the area of the figure. Show all work.

1. Rectangle with length of 8 cm and width 6 cm		
Drawing:	Perimeter:	Area:
2. A parallelogram with base 12 inches and height 7 inches		
Drawing:	Perimeter:	Area:

TOPIC EIGHT: FRACTION - DECIMAL - PERCENT CONVERSIONS

By the beginning of 8th grade you will need to be proficient in calculating converting between percents, decimals, and fractions.

Review:

A percent is a fraction with a denominator of 100. For example 35% is the same as $\frac{35}{100}$, which is also the same as 0.35.

To convert a decimal into a percent, multiply it by 100.

$$0.64 \rightarrow 0.64(100) = 64\%$$

$$1.05 \rightarrow 1.05(100) = 105\%$$

$$0.05 \rightarrow 0.05(100) = 5\%$$

To convert a percent into a decimal, divide it by 100.

$$64\% \rightarrow 64 \div 100 = 0.64$$

$$105\% \rightarrow 105 \div 100 = 1.05$$

$$5\% \rightarrow 5 \div 100 = 0.05$$

To convert a fraction into a percent, convert the fraction to a decimal by dividing the numerator by the denominator. Then multiply the decimal by 100 to convert into a percent.

$$\frac{1}{4} \rightarrow 1 \div 4 = 0.25$$

$$0.25 \cdot 100 = 25\%$$

Convert the fraction into a decimal

Then convert the decimal into a percent

To convert a percent into a fraction, convert the percent into a decimal. Then make the decimal into a fraction in simplest form (reduced fraction).

$$50\% \rightarrow 50 \div 100 = 0.5$$

$$0.5 \rightarrow \frac{50}{100} \rightarrow \frac{50 \div 50}{100 \div 50} = \frac{1}{2}$$

Convert the percent into a decimal

Then convert the decimal into a fraction

(reduce the fraction into simplest form by dividing both the numerator and the denominator by the same number, in this case 50)

Instruction:

Write each decimal as a percent and as a fraction reduced in simplest form.

1. 0.36	2. 0.003
3. 0.04	4. 5.2

Write each fraction as a decimal and as a percent. *Use a calculator to help with division if needed.*

1. $\frac{3}{5}$	2. $\frac{1}{6}$
3. $\frac{17}{20}$	4. $\frac{25}{8}$

Write each percent as a decimal and as a fraction reduced to simplest form.

1. 70%	2. 9.3%
3. 782%	4. 0.45%

TOPIC NINE: PROPORTIONS

Instructions: Solve each proportions to find the value of the variable.

1. $\frac{10}{8} = \frac{f}{10}$	2. $\frac{7}{3} = \frac{n}{6}$
3. $\frac{9}{6} = \frac{k}{10}$	4. $\frac{7}{t} = \frac{8}{7}$
5. $\frac{4}{3} = \frac{8}{s}$	6. $\frac{a}{9} = \frac{4}{6}$

TOPIC TEN: WORD PROBLEMS

Instruction: For these problems, please show your work when necessary. They are an assortment of challenge questions, logic puzzles, and open response questions.

1. There were 6 pizza pies at the summer barbeque at Abby's House. She shares the pizza with her 7 friends. If all 8 people get the same amount of pizza, what portion of pizza can each person have? *Use pictures, diagrams, or math operations to show your work.*

2. The class decides to make chocolate chip cookies for Mr. Burn's first day of school in September. Each student needs $\frac{3}{4}$ of a stick of butter for the recipe. If 14 students want to make cookies, how many sticks of butter do they need to buy? *Use pictures, diagrams, or math operations to show your work.*

3. Steven's family recipe for macaroni and cheese makes 4 servings at 310 calories each. Steven decided to make $1\frac{1}{2}$ times the original recipe. How many calories are in Steven's batch of macaroni and cheese?

4. Tabatha is dining out at Mande's and decides to get an order of curly fries, chicken fingers, and a coca-cola. The total cost of the food with sales tax came to \$18.64. If Tabatha decides to give the cashier a 20% gratuity (tip), what does her total bill come to?

5. Arlene has $\frac{1}{3}$ as many goldfish as Isabelle. Isabelle has 5 times as many goldfish as Bruce. If Bruce has 18 goldfish, how many goldfish does Arlene have?

6. Meaghan started a baking service. During her first month in business, Meaghan spent \$380 on supplies and drove 800 miles at an average cost of \$0.30 per mile. In addition, her business phone and other expenses were \$198. That month, Meaghan completed 60 jobs, earning \$50 per job. What was Meaghan's **profit** during her first month in business? *Show all your work*

(profit is your expenses subtracted from the amount of money you earn)

7. Denny and Brendan decide to start a paper delivery business to make money over the summer. ***Use tables, graphs, or equations to help you solve.***

a. Denny can deliver 6 papers every 15 minutes and Brendan can deliver 5 papers in that same amount of time. How many papers can they deliver in an hour?

b. In Salem, 90 homes receive papers each day. When would Brendan and Denny need to wake up to deliver all their papers by 8am?