Grade 8 Math topics

A. Number theory

1. Factors
2. Divisibility rules
3. Prime or composite
4. Prime factorization
5. Greatest common factor
6. Least common multiple
7. GCF and LCM: word problems
8. Classify numbers

B. Integers

1. Integers on number lines
2. Graph integers on horizontal and vertical number lines
3. Understanding opposite integers
4. Understanding absolute value
5. Absolute value and opposite integers
6. Absolute value and integers: word problems
7. Compare and order integers
8. Integer inequalities with absolute values

C. Operations with integers

1. Integer addition and subtraction rules
2. Add and subtract integers using counters
3. Add and subtract integers
4. Complete addition and subtraction sentences with integers
5. Add and subtract three or more integers
6. Add and subtract integers: word problems
7. Integer multiplication and division rules
8. Multiply and divide integers
9. Complete multiplication and division sentences with integers
10. Add, subtract, multiply and divide integers
11. Evaluate numerical expressions involving integers

D. Operations with fractions

1. Write fractions in lowest terms
2. Least common denominator
3. Add and subtract fractions with like denominators
4. Add fractions with unlike denominators using models
5. Add fractions with unlike denominators
6. Subtract fractions with unlike denominators using models
7. Subtract fractions with unlike denominators
8. Add and subtract fractions with unlike denominators: word problems
9. Add and subtract mixed numbers
10. Add and subtract mixed numbers: word problems
11. Inequalities with addition and subtraction of fractions and mixed numbers
12. Multiply fractions and whole numbers
13. Multiply two fractions using models

14. Multiply fractions

15. Multiply fractions: word problems

16. Multiply mixed numbers

17. Multiply mixed numbers: word problems

18. Reciprocals and multiplicative inverses

19. Divide whole numbers by unit fractions using models

20. Divide whole numbers and unit fractions

21. Divide fractions

22. Divide fractions: word problems

23. Divide mixed numbers

24. Divide mixed numbers: word problems

25. Evaluate numerical expressions involving fractions

E. Rational numbers

1. Convert between decimals and fractions or mixed numbers

2. Identify rational and irrational numbers

3. Round decimals and mixed numbers

4. Absolute value of rational numbers

5. Compare positive rational numbers

6. Compare rational numbers

7. Put rational numbers in order

F. Operations with rational numbers

1. Add and subtract positive and negative decimals

2. Add and subtract rational numbers

3. Add and subtract rational numbers: word problems

4. Distance between rational numbers on a number line

5. Multiply and divide positive and negative decimals

6. Multiply and divide rational numbers

7. Multiply and divide rational numbers: word problems

8. Evaluate numerical expressions involving positive and negative decimals

9. Evaluate numerical expressions involving rational numbers

10. Apply addition and subtraction rules

11. Apply multiplication and division rules

12. Apply addition, subtraction, multiplication and division rules

G. Exponents

1. Understanding exponents

2. Evaluate powers

3. Write powers of ten with exponents

4. Multiply a whole number by a power of ten: with exponents

5. Multiply a decimal by a power of ten: with exponents

6. Divide by a power of ten: with exponents

7. Multiply and divide by a power of ten: with exponents

8. Solve equations with variable exponents

9. Powers with negative bases

10. Powers with decimal and fractional bases

H. Roots

1. Square roots of perfect squares

2. Estimate square roots

3. Relationship between squares and square roots

4. Solve equations involving squares and square roots

I. Scientific notation

1. Convert between standard and scientific notation
2. Compare numbers written in scientific notation

J. Ratios, rates and proportions

1. Understanding ratios
2. Identify equivalent ratios
3. Write an equivalent ratio
4. Ratio tables
5. Equivalent ratios: word problems
6. Unit rates
7. Equivalent rates
8. Ratios and rates: complete a table and make a graph
9. Use tape diagrams to solve ratio word problems
10. Compare ratios: word problems
11. Compare rates: word problems
12. Ratios and rates: word problems
13. Do the ratios form a proportion?
14. Do the ratios form a proportion: word problems
15. Solve proportions
16. Estimate population size using proportions
17. Scale drawings: word problems

K. Percents

1. Convert between percents, fractions and decimals
2. Compare percents to fractions and decimals
3. Find what percent one number is of another
4. Find what percent one number is of another: word problems

5. Estimate percents of numbers

6. Percents of numbers and money amounts

7. Percents of numbers: word problems

8. Compare percents of numbers

9. Solve percent equations

10. Percent of change

11. Percent of change: word problems

L. Consumer math

1. Price lists

2. Unit prices

3. Unit prices: find the total price

4. Percent of a number: tax, discount and more

5. Find the percent: tax, discount and more

6. Sale prices: find the original price

7. Multi-step problems with percents

8. Estimate tips

9. Simple interest

10. Compound interest

11. Balance a budget

12. Adjust a budget

M. Units of measurement

1. Convert rates and measurements: metric units

2. Mixed metric units

3. Convert square units of length

4. Convert between cubic metres and litres

5. Precision

N. Problem solving

1. Multi-step word problems
2. Guess-and-check word problems
3. Use Venn diagrams to solve problems
4. Elapsed time word problems
5. Consecutive integer problems

O. Expressions

1. Write variable expressions
2. Write variable expressions from diagrams
3. Write variable expressions: word problems
4. Evaluate linear one-variable expressions
5. Evaluate one-variable expressions
6. Evaluate multi-variable expressions
7. Evaluate absolute value expressions
8. Evaluate radical expressions
9. Evaluate rational expressions
10. Identify terms and coefficients
11. Sort factors of expressions

P. Equivalent expressions

1. Properties of addition and multiplication
2. Multiply using the distributive property
3. Simplify variable expressions using properties
4. Add and subtract like terms
5. Simplify linear expressions

6. Factors of linear expressions

7. Identify equivalent linear expressions using algebra tiles

8. Identify equivalent linear expressions

9. Identify equivalent linear expressions: word problems

Q. One-variable equations

1. Which x satisfies an equation?

2. Write an equation from words

3. Model and solve equations using algebra tiles

4. Write and solve equations that represent diagrams

5. Properties of equality

6. Solve one-step equations

7. Solve two-step equations

8. Solve multi-step equations

9. Solve equations involving like terms

10. Solve equations with variables on both sides

11. Solve equations: complete the solution

12. Solve equations: word problems

13. Rearrange multi-variable equations

R. One-variable inequalities

1. Solutions to inequalities

2. Graph inequalities on number lines

3. Write inequalities from number lines

4. Write and graph inequalities: word problems

5. Solve one-step inequalities

6. Graph solutions to one-step inequalities

7. Solve two-step inequalities

8. Graph solutions to two-step inequalities

9. Solve multi-step inequalities

10. Graph solutions to multi-step inequalities

S. Coordinate plane

1. Coordinate plane review

2. Quadrants and axes

3. Follow directions on a coordinate plane

4. Find the distance between two points

T. Lines and angles

1. Identify complementary, supplementary, vertical, adjacent and congruent angles

2. Find measures of complementary, supplementary, vertical and adjacent angles

3. Transversals of parallel lines: name angle pairs

4. Transversals of parallel lines: find angle measures

5. Find lengths and measures of bisected line segments and angles

U. Two-dimensional figures

1. Identify and classify polygons

2. Classify triangles

3. Identify trapezoids

4. Classify quadrilaterals I

5. Classify quadrilaterals II

6. Graph triangles and quadrilaterals

7. Find missing angles in triangles

8. Find missing angles in triangles using ratios

9. Triangle Angle-Sum Theorem

10. Find missing angles in quadrilaterals I

11. Find missing angles in quadrilaterals II

12. Exterior Angle Theorem

13. Interior angles of polygons

14. Parts of a circle

15. Central angles and arc measures

V. Transformations and congruence

1. Symmetry

2. Identify reflections, rotations and translations

3. Describe a sequence of transformations

4. Translations: graph the image

5. Translations: find the coordinates

6. Reflections: graph the image

7. Reflections: find the coordinates

8. Rotations: graph the image

9. Rotations: find the coordinates

10. Describe transformations

11. Sequences of congruence transformations: graph the image

12. Sequences of congruence transformations: choose the sequence

13. Congruence statements and corresponding parts

14. Determine if two figures are congruent: justify your answer

W. Transformations and similarity

1. Similar and congruent figures

2. Dilations: graph the image

3. Dilations: find the coordinates

4. Dilations: find the scale factor

5. Identify similar triangles

6. Side lengths and angle measures of similar figures

7. Determine if two figures are similar: justify your answer

X. Pythagorean theorem

1. Pythagorean theorem: find the length of the hypotenuse

2. Pythagorean theorem: find the missing leg length

3. Pythagorean theorem: find the missing leg or hypotenuse length

4. Pythagorean theorem: find the perimeter

5. Pythagorean theorem: word problems

6. Converse of the Pythagorean theorem: is it a right triangle?

Y. Three-dimensional figures

1. Parts of three-dimensional figures

2. Nets of three-dimensional figures

3. Front, side and top view

4. Base plans

5. Similar solids

Z. Perimeter and area

1. Perimeter

2. Area

3. Area between two shapes

4. Area and perimeter: word problems

5. Area of circles

6. Circumference of circles

7. Circles: word problems

8. Area and perimeter of semicircles and quarter circles

9. Area of compound figures with triangles, semicircles and quarter circles

10. Perimeter and area: changes in scale

AA. Surface area and volume

1. Volume

2. Volume of cubes and rectangular prisms: word problems

3. Volume of compound figures

4. Surface area of prisms and cylinders

5. Surface area of pyramids

6. Volume and surface area of similar solids

BB. Proportional relationships

1. Find the constant of proportionality from a table

2. Write equations for proportional relationships from tables

3. Identify proportional relationships by graphing

4. Find the constant of proportionality from a graph

5. Write equations for proportional relationships from graphs

6. Identify proportional relationships from graphs and equations

7. Identify proportional relationships from tables

8. Graph proportional relationships

9. Interpret graphs of proportional relationships

10. Write and solve equations for proportional relationships

CC. Linear functions

1. Does (x, y) satisfy the linear function?

2. Rate of change: tables

3. Rate of change: graphs

4. Constant rate of change: tables

5. Constant rate of change: graphs

6. Complete a table for a linear function

7. Complete a table and graph a linear function

8. Graph a line from an equation

9. Interpret the graph of a linear function: word problems

10. Write a linear function from a table

11. Write linear functions: word problems

DD. Sequences

1. Identify arithmetic and geometric sequences

2. Arithmetic sequences

3. Geometric sequences

4. Number sequences: mixed review

5. Number sequences: word problems

6. Evaluate variable expressions for number sequences

7. Write variable expressions for arithmetic sequences

EE. Data and graphs

1. Interpret tables

2. Interpret bar graphs

3. Create bar graphs

4. Interpret line plots

5. Create line plots

6. Interpret stem-and-leaf plots

7. Create stem-and-leaf plots

8. Interpret histograms

9. Create histograms

10. Create frequency tables

11. Interpret circle graphs

12. Circle graphs and central angles

13. Choose the best type of graph

FF. One-variable statistics

1. Calculate mean and range

2. Calculate mean, median, mode and range

3. Interpret charts to find mean and range

4. Interpret charts to find mean, median, mode and range

5. Mean and range: find the missing number

6. Mean, median, mode and range: find the missing number

7. Changes in mean and range

8. Changes in mean, median, mode and range

9. Quartiles

10. Identify representative, random and biased samples

GG. Two-variable statistics

1. Interpret line graphs

2. Create line graphs

3. Create scatter plots

4. Identify trends with scatter plots

5. Make predictions with scatter plots

6. Describe scatter plots

HH. Probability

1. Sample spaces of simple events

2. Probability of simple events

3. Probability of opposite, mutually exclusive and overlapping events

4. Experimental probability

5. Make predictions

6. Sample spaces for compound events

7. Compound events: find the number of outcomes

8. Counting principle

9. Identify independent and dependent events

10. Probability of independent events

11. Probability of independent and dependent events