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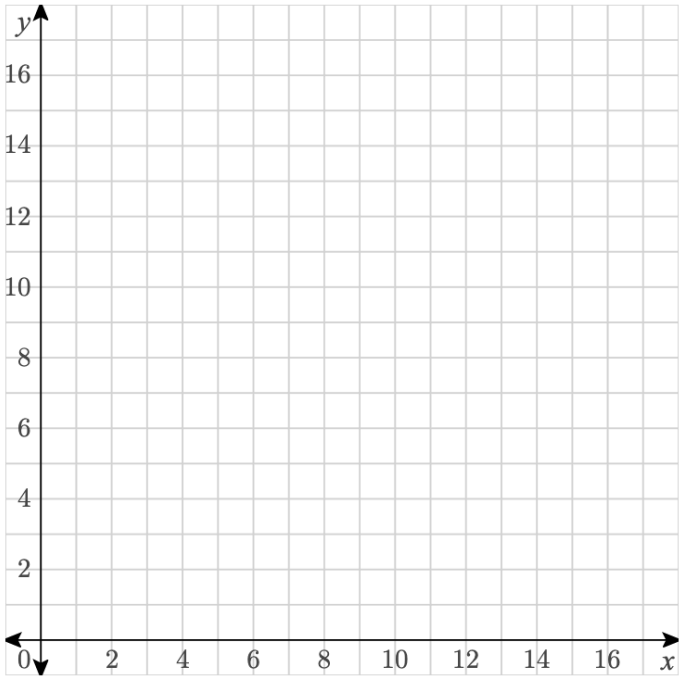
Grade 6 Skill Gap Sample Problems

Skill 1: Using a pattern to graph

Example: Use the pattern to graph the first 4 points.

x	y
16	2
13	4
10	8



Skill 2: Dividing a Decimal by a Whole Number Using Long Division When Divisor is Greater than Dividend

Example:

Divide.

$4\overline{)1.81}$

Skill 3: Finding the Product of Two or More Fractions
Example:

Multiply. Write the answer as a fraction in simplest form.

$$\frac{5}{4} \times \frac{14}{5}$$

Skill 4: Subtracting Mixed Numbers or Proper Fractions from Mixed Numbers with Common Denominators and Regrouping

Example: Subtract. Write the answer as a mixed number in simplest form.

$$10\frac{3}{25} - 7\frac{11}{25}$$

Skill 5: Adding Fractions with Different Denominators without Regrouping

Example: Add. Write the answer as a fraction in simplest form.

$$\frac{3}{4} + \frac{1}{16}$$

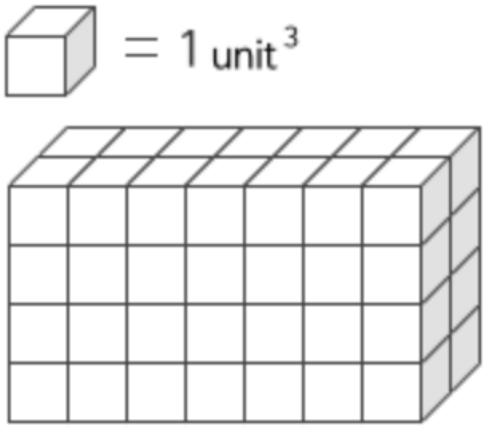
Skill 6 : Dividing a Whole Number by a Unit Fraction

Example: Find the quotient.

$$7 \div \frac{1}{8}$$

Skill 7: Finding the Volume of a Prism Using Unit Cubes

Example: Find the volume V of the figure.



Skill 8: Multiplying Two Numbers Vertically with a Whole Number and a Tenth

Example: Multiply.

$$\begin{array}{r} 25.6 \\ \times \quad 8 \\ \hline \end{array}$$

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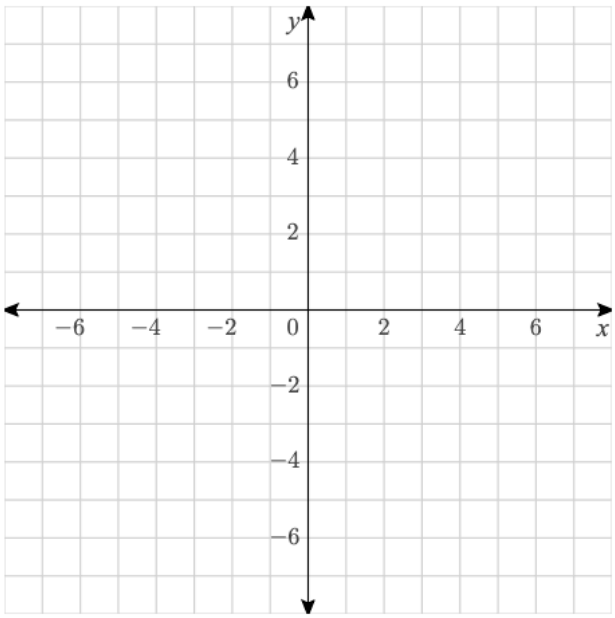
Grade 7 Skill Gap Sample Problems

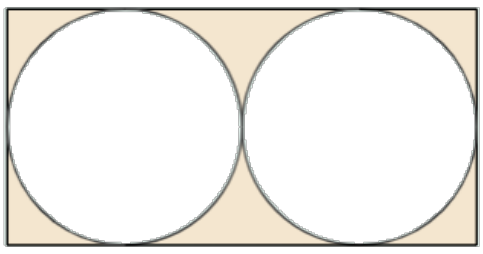
Skill 1: Graphing a Linear Equation Using a Table with No Integer Rules

Example: Graph the linear equation y=4x



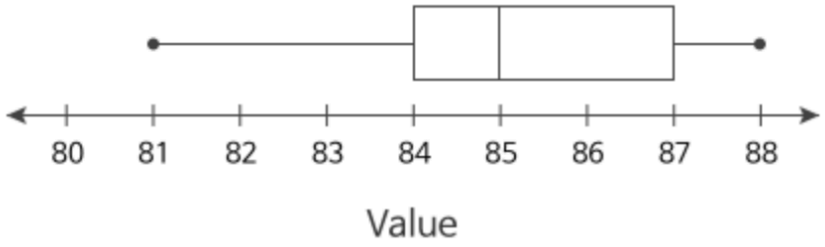
Skill 2: Determining the Area of a Shaded Region with a Given Expression

Example: The expression 2h^2-0.5πh^2) can be used to calculate the area of the shaded region in the figure below. Find the area of the shaded region when the height h of the rectangle is 5 in and π is 3.14.



Skill 3: Finding the IQR Given a Box Plot

Example: Use the box plot to find the interquartile range (IQR)



Skill 4: Distributing a Monomial Over a Binomial with Subtraction

Example: Use the Distributive Property to simplify.

$5(x - 2)$

Skill 5: Writing a Mathematical Expression from a Verbal Expression with Multiple Operations

Example: Write a mathematical expression for the phrase “twelve subtracted from the product of three and y.”

Skill 6: Using Equivalent Ratios to Complete a Table

Example: The ratio of y to x is constant. Use equivalent ratios to complete the table.

y	x
	12
2	
6	72

Skill 7: Combining Like Terms with a Single Variable

Example: Simplify. $3y + 6y + y$

Skill 8: Multiplying Fractions with a Mixed Number

Example: Evaluate. Write the answer as a fraction in simplest form.

$$1\frac{3}{4} \times 5\frac{1}{3}$$

Skill 9: Dividing Fractions

Example: Evaluate. Write the answer as a fraction in simplest form.

$$\frac{1}{12} \div \frac{7}{18}$$

Skill 10: Determining the Effects of an Outlier on Measures of Center

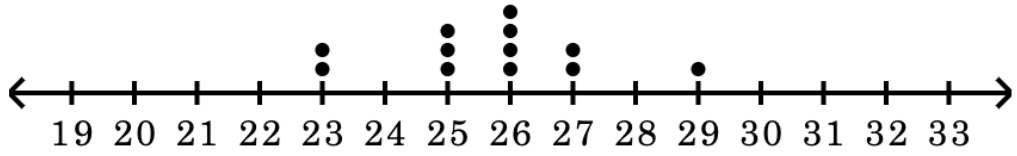
Example: If 75 were removed from the data set below, which measure of center would change more, and how would it be affected?

$$23,24,25,28,29,30,30,32,75$$

A. The mean would change more, and it would increase.
B. The mean would change more, and it would decrease.
C. The median would change more, and it would increase.
D. The median would change more, and it would decrease.

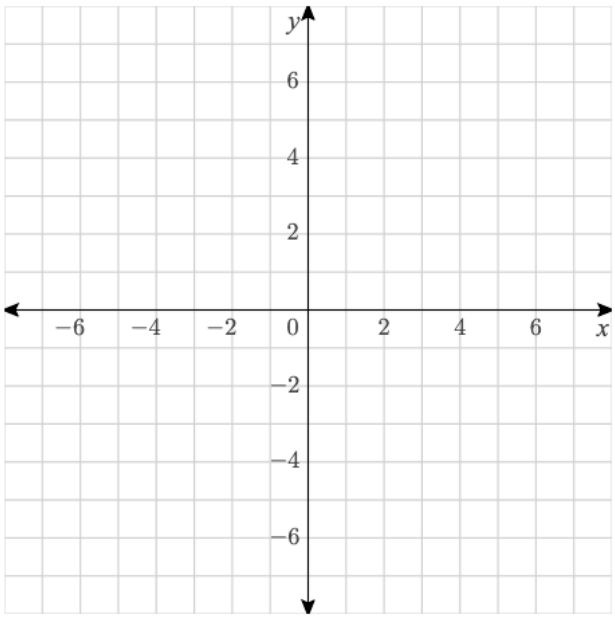
Skill 11: Finding the Median of Data Displayed in a Dot Plot

Example: Find the median of the data.



Skill 12: Graphing a Point on a Coordinate Plane (58%)

Example: Graph $(-2, 6)$ on the coordinate plane.



Skill 13: Finding the Mean of a Data Set (59%)

Example: Find the mean of the data set.

$$94, 87, 84, 81, 96, 82, 92$$

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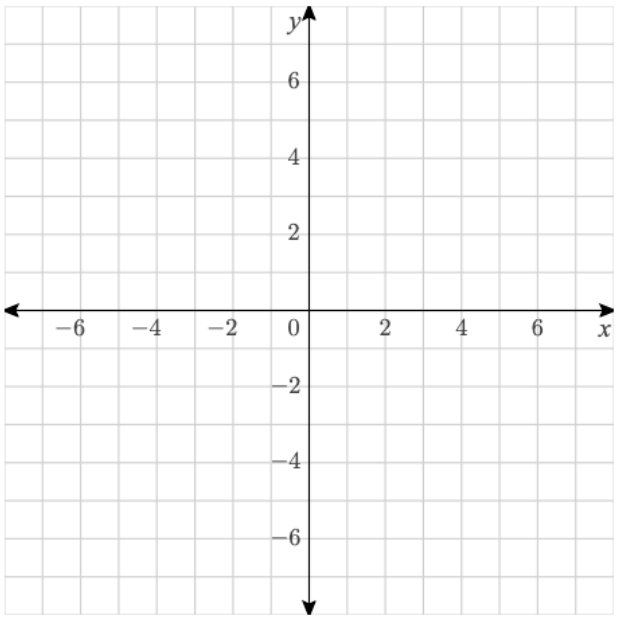
Grade 8 Skill Gap Sample Problems

Skill 1: Graphing a Direct Variation

Example: Graph the direct variation.

$y = -5x$



Skill 2: Writing a Direct Variation from a Word Problem

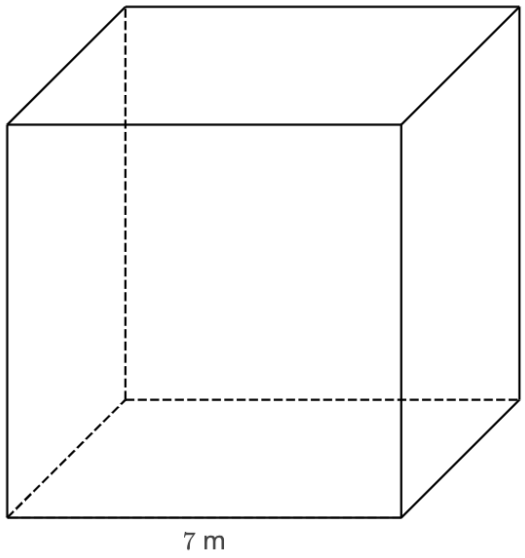
Example: Stephanie has a part-time job at a café that pays an hourly wage. When she works 4 hours, she earns $\$29$. The amount of money Stephanie earns, y, varies directly with the number of hours she works, x. Write an equation for the direct variation that models this relationship, then find the amount of money Stephanie will earn if she works 40 hours.

Skill 3: Calculating the Exact Circumference Given the Radius

Example: Find the circumference C of a circle with a radius of 7 in. Write the answer in terms of π.

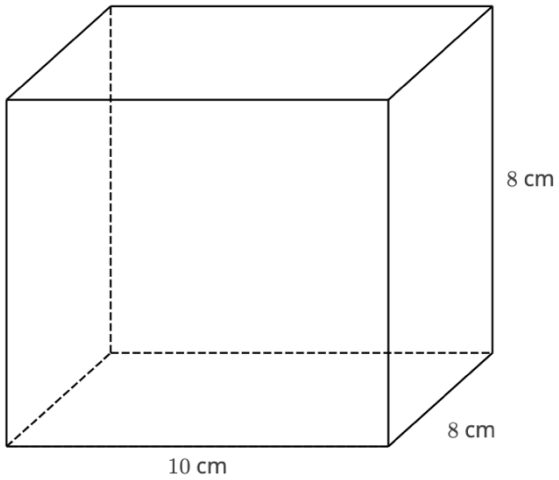
Skill 4: Determining True Statements About Two Dot Plots Given Equal Measure of Center

Example: Find the surface area S of the cube



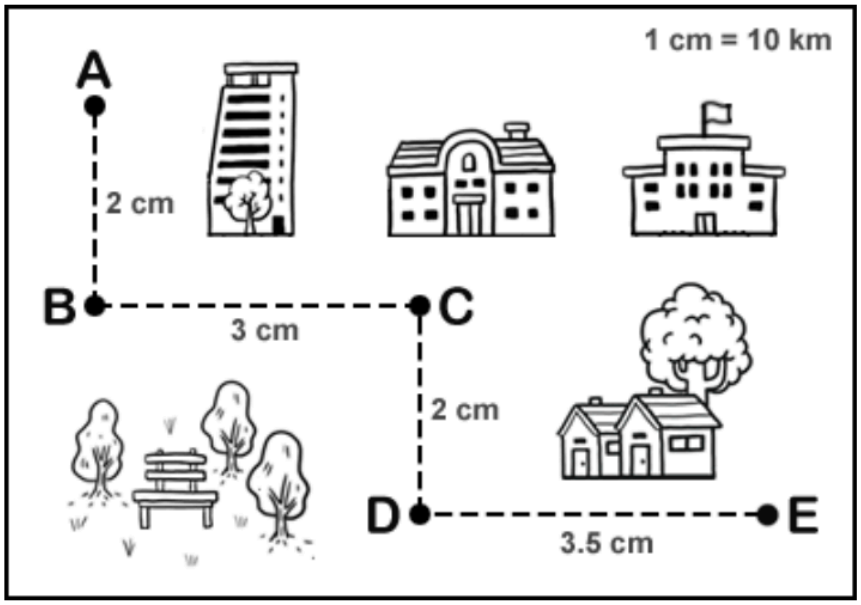
Skill 5: Determining the Surface Area of a Cube or Right Rectangular Prism

Example: Find the surface area S of the right rectangular prism.



Skill 6: Using Scale to Find Lengths and Distances

Example: Find the actual distance in km along the given path from A to D.



Skill 7: Solving Percent Problems with a Proportion

Example: The base sales tax rate in Florida is 6%. How much is the sales tax on a sweatshirt that costs $65?

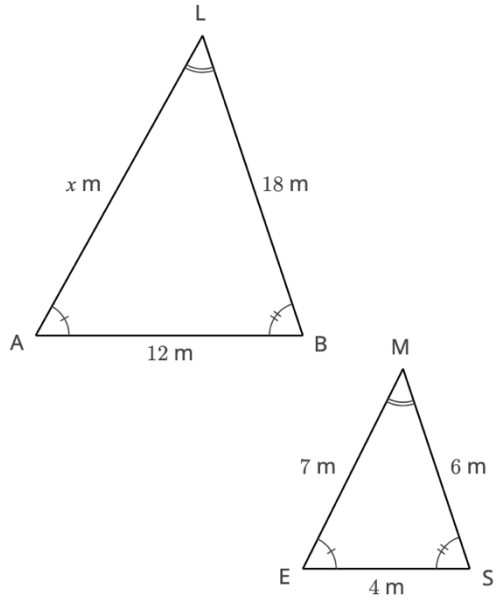
Skill 8: Identifying Representative Samples

Example: Knowre Middle School is going to choose a cougar or a penguin as their new mascot. Frederick wants to know which of the mascots the students prefer. Determine which methods will result in a representative sample.

A. surveying all the teachers at Knowre Middle School
B. surveying all the volleyball players at Knowre Middle School
C. surveying every tenth student that enters Knowre Middle School
D. surveying all the students in Frederick's math class

Skill 9: Finding Length of Unknown Side Given Two Similar Triangles

Example: Two similar triangles are shown below. Find the value of x.



Skill 10: Using Cross Products to Solve Proportions

Example: Solve the proportion.

$$\frac{a}{6} = \frac{4}{10}$$

Skill 11: Solving Two Step Equations

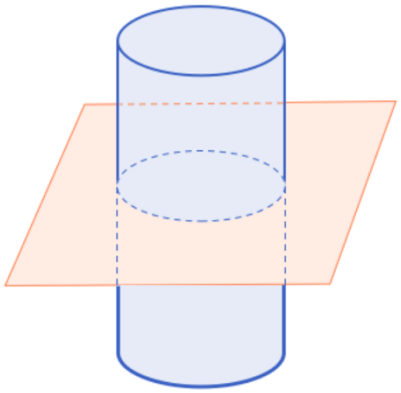
Example: A movie subscription company charges a monthly fee of $30 plus $4 per movie watched. What is the maximum number of movies a subscriber can watch in one month if they have $150 to spend?

Skill 12: Finding the Probability of an Event with Given Sample Set

Example: A bag contains 12 marbles: 5 green, 4 blue, 1 orange, and 2 purple. If one marble is randomly drawn from the bag, find P(blue). Write the answer as a decimal or a fraction in simplest form.

Skill 13: Identifying Cross Sections Formed by Planes that are Parallel or Perpendicular to the Base

Example: A plane intersects a cone parallel to its base, as shown below. Identify the cross section.



Skill 14: Finding the Unit Rate from a Graph

Example: Find the unit rate in m/s.