7th Grade Math

placement test

Welcome!

Thank you for your interest in Thinkwell. We know the curriculum selection process for your homeschool student can be challenging. This Placement Test was created to provide you with a tool to place your student in the appropriate level of math.

Please keep in mind, no placement test is perfect. If you have questions or concerns about the results of your student's placement test, reach out to us at Thinkwell support: support@thinkwell.com.

Contents

Instructions and Overview

This placement test consists of 25 free-response questions. There is no time-limit for the test, but it shouldn't take your student longer than an hour to an hour and a half to complete. Your student should work each problem to the best of their ability. If they are unable to answer an item, tell them to move on to the next item and leave the question unanswered.

The 7th Grade Math placement test will assess your student's aptitude for the following skill areas:

- o Using the order of operations.
- o Writing the prime factorization of numbers.
- o Subtracting fractions with unlike denominators.
- o Finding the measures of central tendency (mean, median, and mode) and the range of data sets.
- o Solving linear equations and inequalities
- o Comparing rates.
- o Converting units of measure.
- o Identifying points, lines, planes, triangles, and congruent polygons
- o Finding the perimeter and area of polygons and composite figures.
- o Finding the volume of cylinders.
- o Finding the surface area of pyramids.
- o Graphing linear functions.
- o Extending patterns in arithmetic sequences.
- o Finding theoretical and experimental probabilities.
- o Identifying the location of points on a coordinate plane.

We recommend you **print the question portion of this document (pages 5–7)** so your student can work out the problems with pencil and paper.

Please be aware that **the answer key for this test starts on page 10**. We advise you to share the answer key with your student only after they've completed the test in its entirety.

Instructional videos for all the question items on this test are available by clicking the solution link in the answer key. Questions? Concerns? Please reach out to us at support@thinkwell.com.

7th Grade Math Placement Test

1. Evaluate the expression.
   $8 + (15 \times 2) \div 10$

2. Identify a pattern in the arithmetic sequence. Name the next three terms.
   5, 12, 19, 26, [ ], [ ], [ ], ...

3. Solve the equation.
   $x + 22 = 58$

4. Write the prime factorization of 100.

5. Subtract. Write the answer in simplest form.
   $$\frac{5}{12} - \frac{1}{10}$$

6. Solve the equation.
   $s - 5 = 12$

7. Solve the equation.
   $5x = 15$

8. Find the mean, median, mode, and range of the data set.
   12, 15, 80, 7, 10, 20, 15, 18

9. The Party Popcorn Popper can make 12 cups of popcorn per minute. Which popper pops at the same rate as the Party Popcorn Popper?

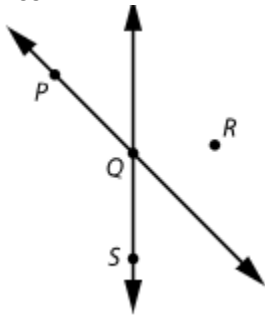 | Popper | Rate |
   |---|---|
   | Peppy Popper | $\frac{30 \text{ cups}}{5 \text{ minutes}}$ |
   | Prince of Popper | $\frac{36 \text{ cups}}{4 \text{ minutes}}$ |
   | Pricey Popper | $\frac{36 \text{ cups}}{3 \text{ minutes}}$ |

10. A telephone pole casts a shadow that is 13 ft long when a 2 ft tall fire hydrant casts a shadow that is 1 ft long. How tall is the telephone pole?

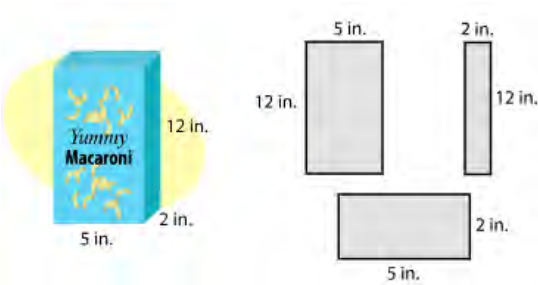11. Use the diagram to name a point shared by two lines.

12. The ladder, slide, and ground form a triangle. The measure of ∠A is 40° and the measure of ∠B is 80°. Classify the triangle.
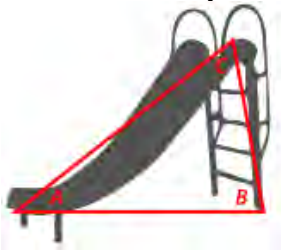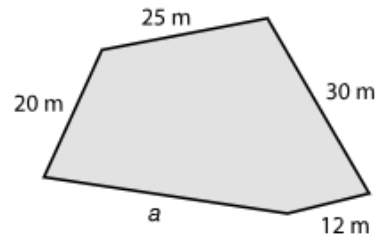

13. Which quadrilateral is congruent to the top of this box of macaroni?
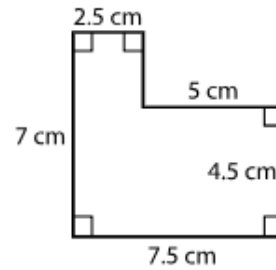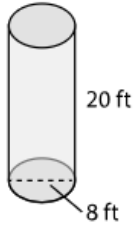

14. Convert 5 yards to inches.

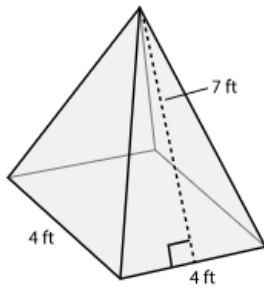15. What is the length of side *a* if the perimeter equals 123 m?

16. Find the area of the polygon.

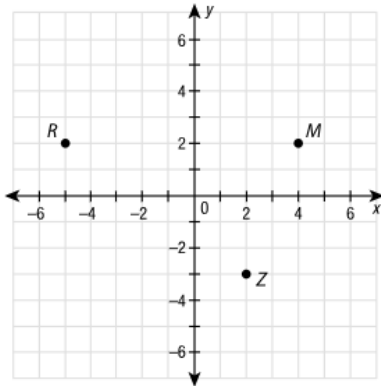17. Find the volume *V* of the cylinder to the nearest cubic foot. Use 3.14 for π.

20 ft

8 ft

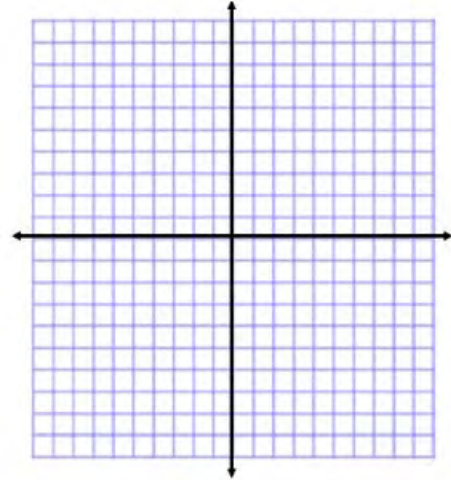18. Find the surface area of the pyramid.

7 ft

4 ft

4 ft

19. Name the quadrant where each point is located.

20. Solve the equation.

$-4a = 24$

21. Graph the function described by the equation.

$y = 3x - 1$

22. Solve the equation.

$9x - 2 = 25$

23. Solve the inequality.

$9x - 1 > 17$

24. For one month, Terry recorded the time at which her school bus arrived. She organized her results in a frequency table. Find the experimental probability that the bus will arrive between 8:20 and 8:24.

Time	8:15-8:19	8:20-8:24	8:25-8:29
Frequency	10	11	3

25. If you roll a fair number cube 42 times, how many times do you expect to roll a 3?

Scoring Guide

Use the scoring rubric below to help determine if 7th Grade Math is the appropriate course for your student.

Your placement test score and corresponding course recommendation should not be the only determining factor when deciding the appropriate course for your student. Your student's grade-level experience in previously completed math courses should also be considered.

Please feel free to contact a Thinkwell representative at support@thinkwell.com if you'd like to discuss your student's course placement in greater detail.

Number of questions correct	Course recommendation
7 or less	6th Grade Math
8 – 20	7th Grade Math
21 or more	Honors 7th Grade Math

See the Answer Key for explanations of all placement test questions. Click the blue video link to view instructional video explanations for all question items.

Wondering about the difference between 7th Grade Math and Honors 7th Grade Math? Read on to learn more.

Regular 7th Grade Math vs Honors 7th Grade Math

Honors 7th Grade Math is a faster-paced, more rigorous course than our standard 7th Grade Math course. Both courses will prepare your student for success in 8th Grade Math and beyond; however, if you anticipate your student going on to higher level mathematics, like Precalculus or Calculus, the Honors sequence will benefit your student. In brief:

- The content in Honors 7th Grade Math covers a greater scope and includes more advanced concepts than the standard 7th Grade Math.

- Each of the 109 daily lessons in Honors 7th Grade Math includes an average of 6 minutes of video content, while each of the 94 daily lessons in the standard 7th Grade Math includes an average of 5 minutes of video content.

- The assessments in Honors 7th Grade Math provide students with questions that are a higher level of difficulty than those in the standard 7th Grade Math.

answer key

1. Evaluate the expression.
   8 + (15 × 2) ÷ 10

   Answer: 11

   View Video Explanation: Order of Operations

2. Identify a pattern in the arithmetic sequence. Name the next three terms.
   5, 12, 19, 26, [ ], [ ], [ ], ...

   Answer: 33, 40, 47

   View Video Explanation: Patterns and Sequences

3. Solve the equation.
   $x + 22 = 58$

   Answer: 36

   View Video Explanation: Addition Equations

4. Write the prime factorization of 100.

   Answer: $2 \cdot 2 \cdot 5 \cdot 5$

   View Video Explanation: Factors and Prime Factorization

5. Subtract. Write the answer in simplest form.
   $$\frac{5}{12} - \frac{1}{10}$$

   Answer: 19/60

   View Video Explanation: Adding and Subtracting with Unlike Denominators

6. Solve the equation.
   $s - 5 = 12$

   Answer: 17

   View Video Explanation: Subtraction Equations

7. Solve the equation.
   $5x = 15$

   Answer: 3

   View Video Explanation: Multiplication Equations

8. Find the mean, median, mode, and range of the data set.
   12, 15, 80, 7, 10, 20, 15, 18

   Answer: mean = 22.125, median = 15, mode = 15, range = 73

   View Video Explanation: Measures of Central Tendency

9. The Party Popcorn Popper can make 12 cups of popcorn per minute. Which popper pops at the same rate as the Party Popcorn Popper?

Popper	Rate
Peppy Popper	30 cups / 5 minutes
Prince of Popper	36 cups / 4 minutes
Pricey Popper	36 cups / 3 minutes

   Answer: Pricey Popper

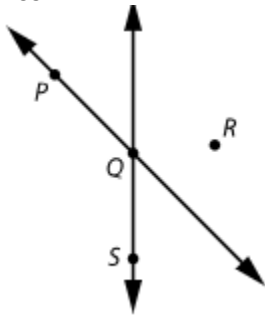   *View Video Explanation: Applying Rates and Ratios*

10. A telephone pole casts a shadow that is 13 ft long when a 2 ft tall fire hydrant casts a shadow that is 1 ft long. How tall is the telephone pole?

    Answer: 26 ft

    View Video Explanation: Indirect Measurement
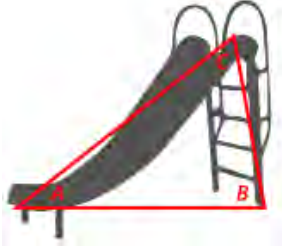
11. Use the diagram to name a point shared by two lines.

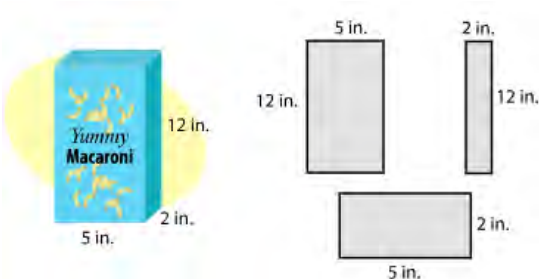Answer: Q

View Video Explanation: Points, Lines, and Planes

12. The ladder, slide, and ground form a triangle. The measure of ∠A is 40° and the measure of ∠B is 80°. Classify the triangle.

Answer: acute

View Video Explanation: Triangles

13. Which quadrilateral is congruent to the top of this box of macaroni?
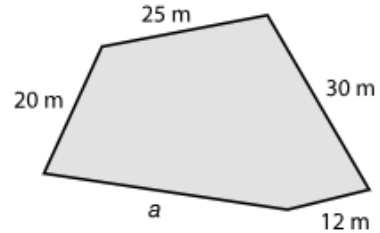

Answer: the rectangle with dimensions 5 in. by 2 in.

View Video Explanation: Congruent Polygons

14. Convert 5 yards to inches.

Answer: 180 in.
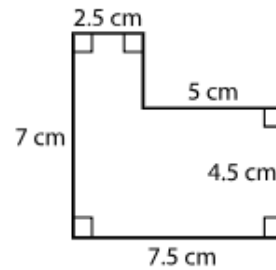
View Video Explanation: Converting Customary Units

15. What is the length of side *a* if the perimeter equals 123 m?
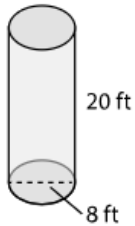

Answer: 36 m

View Video Explanation: Perimeter

16. Find the area of the polygon.

Answer: 40 cm^2
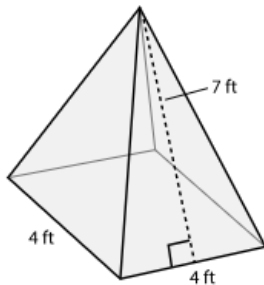
View Video Explanation: Area of Composite Figures

17. Find the volume *V* of the cylinder to the nearest cubic foot. Use 3.14 for π.

20 ft

8 ft

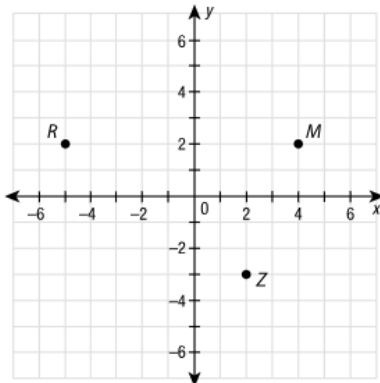Answer: 1,005 ft^3

View Video Explanation: Volume of Cylinders

18. Find the surface area of the pyramid.

7 ft

4 ft

4 ft

Answer: 72 ft^2

View Video Explanation: Surface Area

19. Name the quadrant where each point is located.

Answer: Point *R*: Quadrant II
Point *Z*: Quadrant IV
Point *M*: Quadrant I

View Video Explanation: The Coordinate Plane

20. Solve the equation.
$-4a = 24$

Answer: -6

View Video Explanation: Solving Integer Equations

21. Graph the function described by the equation.
$y = 3x - 1$

Answer:
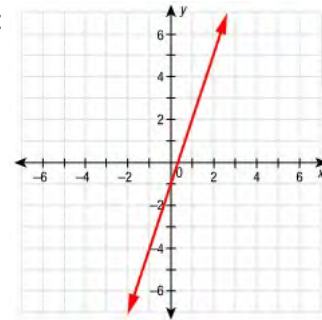
View Video Explanation: Graphing Functions

22. Solve the equation.
$9x - 2 = 25$

Answer: 3

View Video Explanation: Solving Two-Step Equations

23. Solve the inequality.
$9x - 1 > 17$

Answer: $x > 2$

View Video Explanation: Solving Two-Step Inequalities

24. For one month, Terry recorded the time at which her school bus arrived. She organized her results in a frequency table. Find the experimental probability that the bus will arrive between 8:20 and 8:24.

Time	8:15-8:19	8:20-8:24	8:25-8:29
Frequency	10	11	3

Answer: 11/24

View Video Explanation: [Experimental Probability](#)

25. If you roll a fair number cube 42 times, how many times do you expect to roll a 3?

Answer: 7

View Video Explanation: [Making Predictions](#)

About Thinkwell Courses

Thinkwell offers the following core courses in our Homeschool Math series:

- o 6th Grade Math
- o 7th Grade Math
- o 8th Grade Math
- o Algebra 1
- o Geometry
- o Algebra 2
- o Precalculus
- o Trigonometry
- o Calculus

- o Honors 6th Grade Math
- o Honors 7th Grade Math
- o Honors 8th Grade Math
- o Honors Algebra 1
- o Honors Geometry
- o Honors Algebra 2
- o AP Calculus AB
- o AP Calculus BC

What's the difference between the standard Thinkwell courses and the honors courses? In general, the Thinkwell Honors courses will be faster-paced and more rigorous than our standard courses. Our Honors courses will cover more material than the standard courses and the assessments will be more challenging. Unless you need the Honors recognition for your student's transcript, or unless your student is aiming to pursue a science or math-related course of study, we recommend sticking with the standard course sequence.

Typical Sequence of Secondary Math Courses

A typical sequence of secondary math courses completed by a college-bound student is listed below. Most college-bound students will take seven or eight years of math between 6th and 12th grades, beginning with 6th Grade Math and ending with Precalculus or Calculus.

Standard Sequence:

Middle school:

Year 1	Year 2	Year 3
6th Grade Math	7th Grade Math	8th Grade Math

High School:

Year 1	Year 2	Year 3	Year 4
Algebra 1	Geometry	Algebra 2	Precal or Trig

Accelerated Sequence:

Middle school:

Year 1	Year 2	Year 3
7th Grade Math	8th Grade Math	Algebra 1

High School:

Year 1	Year 2	Year 3	Year 4
Geometry	Algebra 2	Precal or Trig	Calculus

Where Do You Begin?

If you wondering about where to start your student with the Thinkwell math course sequence, we recommend that you **begin with the end in mind**.

In other words, where do you want your student to be at the end of their course of study in high school? If your student is college-bound, and you want them to take Calculus before they go to college, then work backwards from the 'accelerated sequence' above to see where you need to be right now.

Unless your student is planning to pursue a science or math-related degree, Calculus doesn't necessarily need to be the terminal course for your high school student.

Questions? Please reach out to us at support@thinkwell.com. We're here and happy to help.