Math Placement Test 1 - Practice Questions

IMPORTANT NOTE: This document strives to be ADA compliant. If you use assistive technology, please read the information provided in **Appendix A** for guidance on navigating this document and for access to the web version of this content.

Overview

There are two math placement tests.

- Students must earn a 70% on the Math Placement Test 1 to place into MAT 143 or MAT 152.
- Students must earn a 70% on the Math Placement Test 2 to place into MAT 171.
- This test takes approximately 60 minutes to complete.

See the lists below of the content areas for the test.

Math Placement Test 1

- Whole Numbers
- Fractions and Mixed Numbers
- Decimals
- Ratios, Rates, and Proportions
- Percent
- Measurement
- Geometry
- Real Numbers
- Concepts in Statistics
- Solving Equations and Inequalities

The following pages contain sample test questions and an answer key for MAT 025. During the practice test and real test experiences, students should use the Placement Test Formula Chart.

Math Placement Test 1 - Practice Test Questions

Whole Numbers

1. You open up a shop in Hawaii and want to offer customers four days of extreme experiences. On the first 2 days the customer can choose a water activity: snorkeling, fishing and water skiing. The next 2 days, the customer can choose from more extreme activities: zip lining, sky diving, rock climbing, and cave exploring. In how many ways can a customer choose a water activity for the first 2 days and then another water activity for last 2 days?

    a. 12
    b. 7
    c. 13
    d. 4

2. Constance wants brand new carpet for her square-shaped bedroom. Her bedroom is 11 ft. by 11 ft. How much carpeting will Connie need to purchase to cover half of the floor?

    a. 121 sq. ft.
    b. 60.5 sq. ft.
    c. 120 sq. ft.
    d. 65 sq. ft.

3. The Krispy Creme "donuts are ready" sign at three different Krispy Crème locations, lights up when the donuts are ready at every 10 minutes, 15 minutes and 20 minutes, respectively. If the time is 9:00 pm and donuts are ready at all three shops, how many minutes will it take for the signs to again light up at the same time?

    a. 30 minutes
    b. 40 minutes
    c. 50 minutes
    d. 60 minutes

(Test continued on next page)

Fractions

4. In *Figure 1*, below, there are 3 out of 5 triangles shaded blue. In *Figure 2*, below, there are 6 out of 10 triangles shaded blue. What fraction represents the total blue shaded triangles between Figure 1 and 2?
   a. 6/5
   b. 10/12
   c. 9/15
   d. 9/10

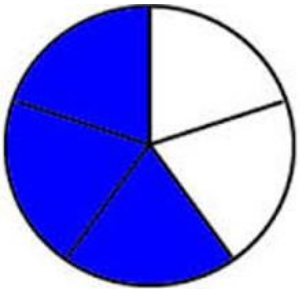

Figure 1

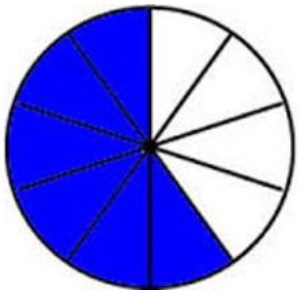

Figure 2

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Decimals

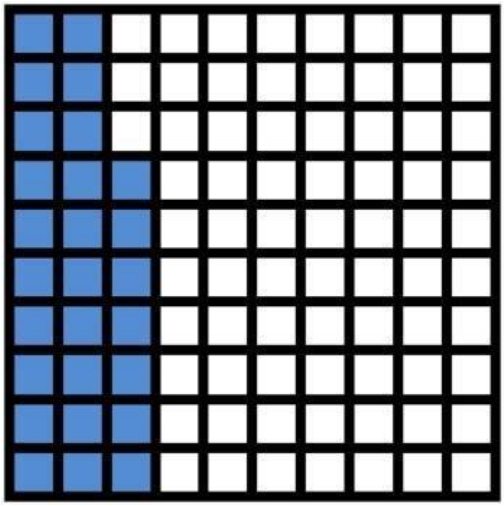


Figure 3

5. In *Figure 3*, above, the area of each square represents 1/100 of a square inch. As a decimal, which one of the following is true?

    a. Since the area of each square represents 1/100 of a square inch, then the portion of Figure shaded is representing 0.2 as an equivalent decimal.
    b. Since the area of each square represents 1/100 of a square inch, then the portion of Figure shaded is representing 0.27 an equivalent decimal.
    c. Since the area of each square represents 1/100 of a square inch, then the portion of Figure shaded is representing 0.25 as an equivalent decimal.
    d. Since the area of each square represents 1/100 of a square inch, then the portion of Figure shaded is representing 0.23 as an equivalent decimal.

Ratios, Rates and Proportions

6. A lime sherbet punch can be made from 2 pints of lime sherbet and 4-liters of Ginger Ale. If I triple the lime sherbet, how many liters of Ginger Ale will be needed to make the punch?

    a. 10 liters
    b. 11 liters
    c. 12 liters
    d. 13 liters

7. The following prices for pecans are all in proportion except,

    a. $2 per oz. equals $6 per 3 oz.
    b. $4 per 2 oz equals $20 per 10 oz.
    c. $9 per 4.5 oz equals $36 per 18 oz.
    d. $13 per 6 oz equals $29 per 12 oz.

Percent

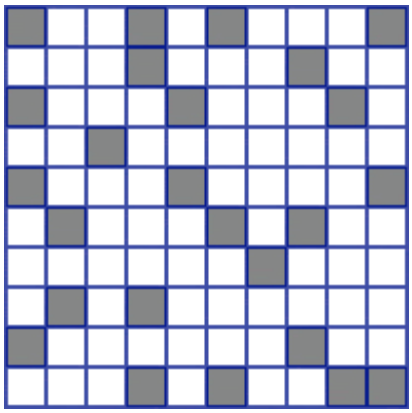


Figure 4

8. In Figure *4* above, what is the percent of unshaded blocks?

    a. 60%
    b. 65%
    c. 70%
    d. 75%

9. What is the discounted price for a pair of shoes that cost $ 75.00, if the discount is 25%?
    a. $55.00
    b. $56.25
    c. $57.50
    d. $58.00

(Test continued on next page)

10. What is the original cost of a sofa if it has been discounted 40% and the amount after the discount is $165.00?

    a. $275.00
    b. $660.00
    c. $231.00
    d. $412.50

Measurement

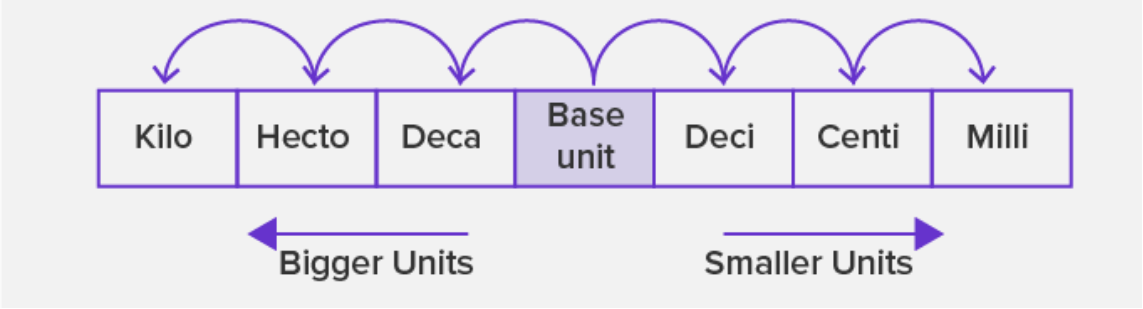


Figure 5

11. *Figure 5*, above, shows the relationship between metric prefixes. If the base unit is **meter**, convert 87,000 mm to km.

    a. 0.87 km
    b. 0.0087 km
    c. 0.087 km
    d. 0.00087 km

12. Laurence purchased a 200 ml bottle of juice and purchased a second 3-liter bottle of juice. What is the difference in liters between the two juice bottle amounts?

    a. 2.08 L
    b. 2.008 L
    c. 2.8 L
    d. 28 L

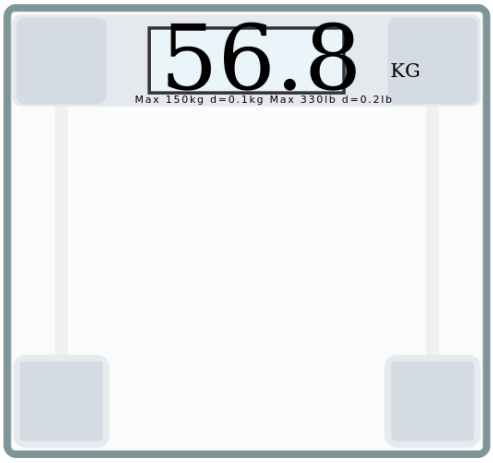


Figure 6

13. *Figure 6*, above, shows a digital scale and the weight of Ms. Roberson's grandson, Romiin in kg. How many pounds is Romiin? (Round to the nearest whole number)

    a. 125 lbs
    b. 26 lbs
    c. 109 lbs
    d. 59 lbs

Geometry

14. The circumference of a circle is given by the formula, $c = \pi d$, where $\pi = 3.14$ .The radius of the tire of a Lexus is 17 inches. Find the circumference of the tire. Round your final answer to the nearest whole number.

    a. 227 inches
    b. 53 inches
    c. 907 inches
    d. 107 inches

(Test continued on next page)

15. Given the right triangle in *Figure 7* below, if a = 3 ft and c = 5 ft, find b, the missing side.

a. 3.5 ft
b. 2 ft
c. 4 ft
d. 16 ft

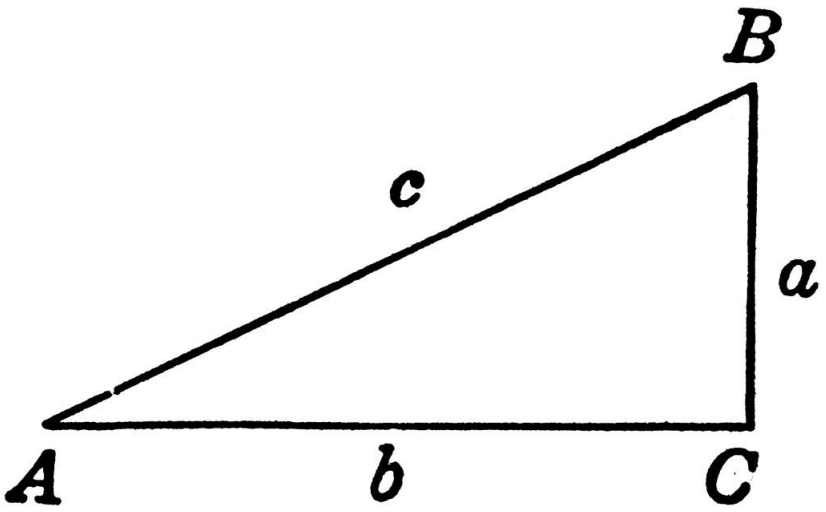


Figure 7

16. Evaluate: $\sqrt{169}$

a. 84.5
b. -169
c. 13
d. 28,561

(Test continued on next page)

17. For Figure *8* below, find the perimeter of the polygon.

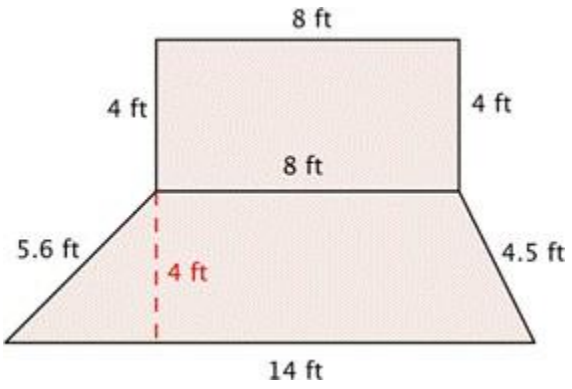


Figure 8

a. 48.1 ft
b. 52.1 ft
c. 40.1 ft
d. 76 ft

Real Numbers

18. Simplify $8\left(3^2-6\right)\div 4$

a. 6
b. 16.5
c. 4
d. 0

19. *Simplify* $\sqrt{36}+\left|-50\right|-\left(-70+35\right)$.

a. 21
b. -79
c. -9
d. 91

(Test continued on next page)

20. Translate and evaluate the expression, x divided by 4 plus 9, if x = 4.

    a. 4/13
    b. 10
    c. 19
    d. 1/13

21. Simplify the expression $4^2 - 5^2$.

    a. -9
    b. 9
    c. 1
    d. -2

22. Simplify the expression $\left(\frac{15}{6} - \frac{9}{6}\right) - \left(\frac{8}{9}\right)^0$.

    a. 1/9
    b. -7/18
    c. 1
    d. 0

23. Simplify -6^3 .

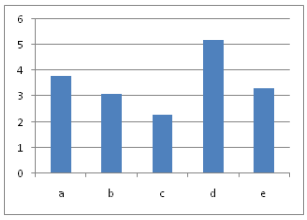
a. 216
b. 18
c. -216
d. -18

Concepts in Statistics

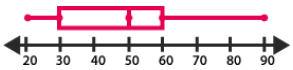
24. There are many types of graphical representations. Which graph records the number of observations in a set of data?
    a. A Frequency Table

Rulers of France		
Reign (Years)	Tally	Frequency
1-15	𝍸 𝍸 𝍸 III	18
16-30	𝍸 𝍸 I	11
31-45	𝍸 I	6
46-60	IIII	4
61-75	I	1

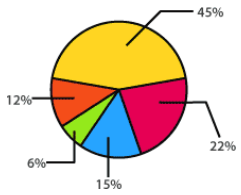
b. Bar Graphs



c. Box and Whisker Plot



d. Circle Graph



25. Find the **mean** of the following 5 NASCAR Motor Speedway tracks: Talladega 2.66 miles Pocono 2.5 miles, Atlanta, 1.54 miles, Bristol 0.533 mile, and Lowes (Charlotte) 1.5 miles.

a. 1.074 miles
b. 1.07445 miles
c. 1.7466 miles
d. 8.733 miles

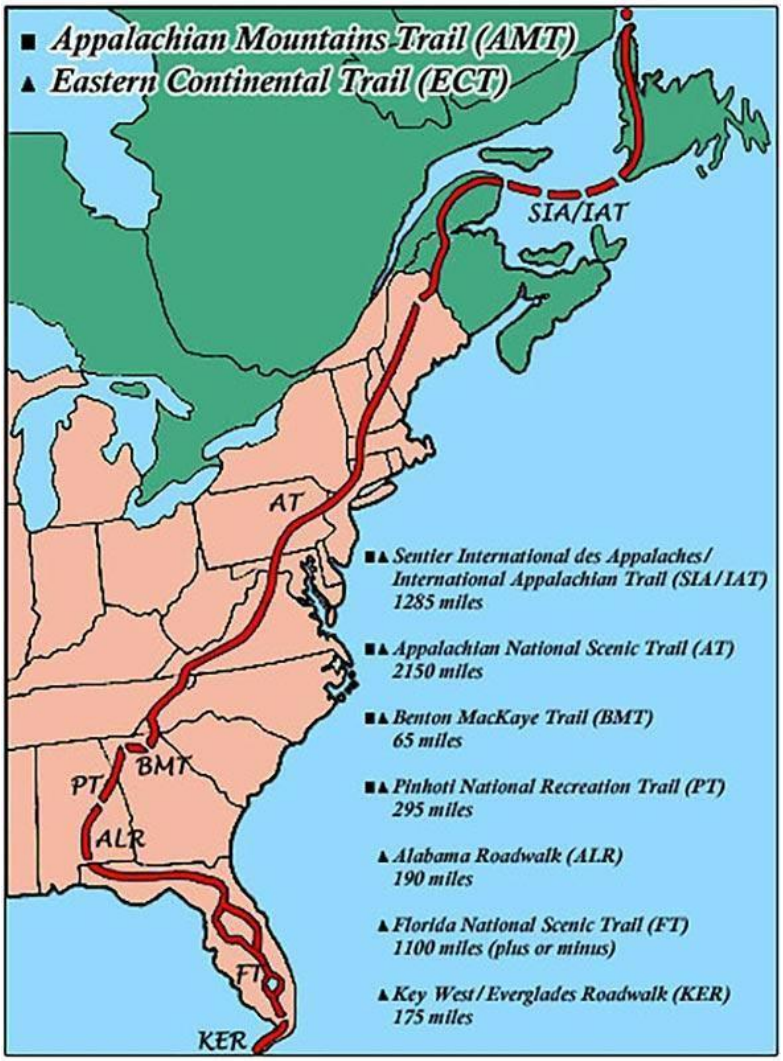


Figure 14

26. In *Figure 14* above, the map shows several US hiking trails. What is the **mode** of the miles given for the trails?

a. There is no mode.
b. 751.43 miles
c. 259 miles
d. 2085 miles

(Test continued on next page)

$$-8x^4 + 5x^2 + 4x - 7$$

Figure 15

27. In *Figure 15* above, the square has the side length described by a polynomial expression. How many terms are this polynomial?

a. 1
b. 2
c. 3
d. 4

Solving Equations and Inequalities

28. 25Solve the equation below for *x*, $x + (-9) = 26$.

a. x = -35
b. x = -17
c. x = 17
d. x = 35

29. Solve the equation below for *y*, $41 - y = 90$.

a. y = - 49
b. y = 131
c. y = 49
d. y = - 46

30. Solve, $7x + 11 = -73$.

a. 12
b. 13
c. -13
d. -12

31. Solve: $3y - 2 = 6 - 4y$.

a. y = 7/8
b. y = 56
c. y = 8/7
d. y = 8

32. Which equation gives a solution of all real numbers?

a. x = 1
b. x = -1
c. 2x = 2x

d. 2x = 3x

33. Which equation matches the following: *Henry's appetite is twice as big as Guy's*? Assume H represents Henry's appetite and G represents Guy's appetite.

a. 2G = H
b. GH = 2
c. 2H = G
d. 2 + G = H

34. In the question above, if Guy can eat 2 full racks of baby back ribs, how many full racks of baby back ribs can Henry eat?

a. 1
b. 4
c. 3
d. 6

35. The diagram in *Figure 9* below shows 4 graphs of inequalities. Which graph shows $-1 < x \leq 3$?

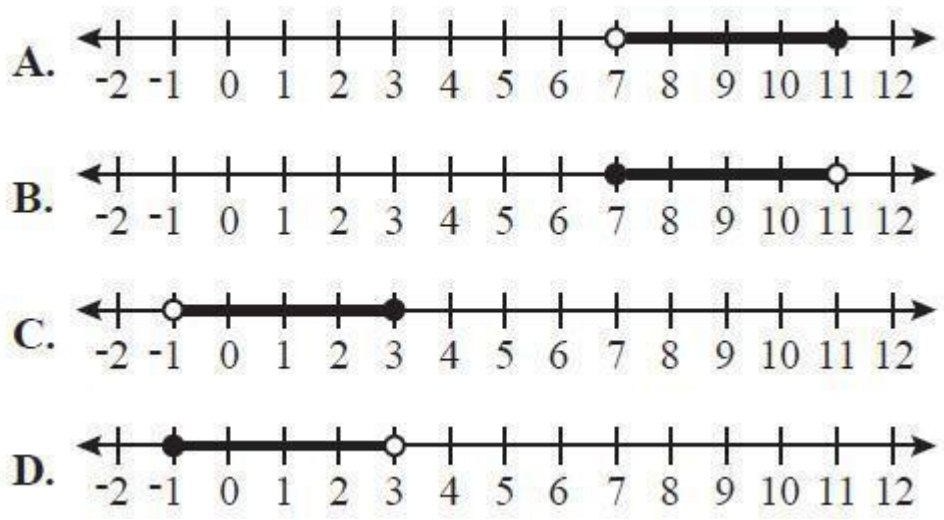


Figure 9

(Test continued on next page)

36. An iguana has to keep its body temperature between 75 degrees and 95 degrees (Fahrenheit). Write this as an inequality, where x represents the iguana's body temperature.

a. $\{x \mid x > 75\}$ *and* $\{x \mid x < 95\}$

b. $\{x \mid x < 95\}$

c. $\{x \mid x > 75\}$

d. $\{x \mid x > 95\}$ *and* $\{x \mid x < 75\}$

37. When solving for *h* in $h - 28 > 28$ and then graphing the solution, there will be [----blank---] on the number line. (Fill in the blank.)

a. a closed circle
b. an open circle
c. an asterisk
d. a small square

(End of MAT 025 Test)

MAT 025 Answers and Explanations

Whole Numbers and Fractions

1. ANSWER: **a**

   This problem uses the basic principle of multiplication. The shop offers 3 different activities for 2 days to choose from and offers 4 more different activities for the next 2 days. Since the question wants to know how many extreme sports are possible, and since there are 3 on one experience and 4 on the others, then 3 x 4 = 12. There are 12 possible extreme activities to choose from.

2. ANSWER: **b**

   This problem uses the formula for the area of a rectangle, *A = l x w*. In this case, the shape of the room is a square. So, the formula is modified, and the area of a square is *A = s x s.* To cover only half of the floor divide by 2. A = 11 x 11=121/2=60.5 sq. ft.

3. ANSWER: **d**

   Applying Least Common Multiple (*LCM*) will solve this problem. For example, at one Krispy Cremes, the sign will light up every 10, 20, 30, 40, 50, 60 minutes. At the next donut shop every 15, 30, 45, 60 minutes. Lastly, at the third shop every 20, 40, 60 minutes. So, when the signals "are ready" lights up at the same 9:00pm, it will be in every 60 minutes. The *LCM* for 10, 15, and 20 is 60.

4. ANSWER: **a**

   We can write figures 1 and 2 as fractions, 3/5 and 6/10. In order to add these two fractions, the denominators must be the same. You will need to find the Least Common Denominator (LCD) for fractions 3/5 and 6/10. Finding the multiples of 5, by counting by 5's: 5, 10, 15, and so on. Finding the multiples of 10, by counting by 10's: 10, 20, 30, and so on. Looking at the multiples of 5 and 10, 10 appears to be what both numbers have in common. Now we can use 10 to be the new denominator for each fraction. Since there is a new denominator, there should be a new numerator. The steps are as follows:

   $$\frac{3}{5}+\frac{6}{10}=\frac{6}{10}+\frac{6}{10}=\frac{12}{10}=\frac{6}{5}.$$

Decimals

5. ANSWER: **b**

Since each square is 1/100. Counting squares that are blue, there are 27. So, we can write this as a fraction, 27/100. 27/100 can be written as 27 hundredths. Then writing as an equivalent decimal, 0.27.

Ratios, Rates and Proportions

6. ANSWER: **c**

   There are two ratios, 2 pints :4 liters and 6 pints (2 x 3, tripled the amount of sherbet): L liters. Using proportions, and setting the two ratios equal to each other, it follows,

   $\frac{2}{4} = \frac{6}{L}$.

   By cross multiplying, 2 x L = 4 x 6. Multiplying both sides gives, 2L = 24. Solving for L, by dividing both sides by 2, gives, L = 12. So, it will take 12 liters of Ginger Ale for 6 pints of Lime Sherbet.

7. ANSWER: **d**

   To see if two ratios are in proportion, first make sure we are working with the same units, dollars to ounces. Then we set the two ratios equal to each other. Take the cross products of the numerator to denominator which must equal. This show proportions. The multiple-choice answers that are in proportion are a, b, and c. d is not in proportion because, 13 x 12 = 6 x 29 does not equal the same number. Therefore, the prices are not in proportion of each other.

Percent

8. ANSWER: **d**

   By simply counting the unshaded blocks, there are 75 out of 100 blocks, unshaded. This represents 75% unshaded blocks.

9. ANSWER: **b**

   To find the discount price, you first multiply the discount rate x the original price. So, multiply, ($75.00 x .25 = $18.75, remember to change your percent to a decimal by dividing by 100. Therefore, by subtracting $18.75 from the original price of, $75.00, equals the discount price of $56.25.

10. ANSWER: **a**

    Note that since the discount is 40% of the original price, the price after the discount is 60% of the original price. The formula, Percent x Base = Amount can be used to find the original price, where Percent = 60% = 0.6, Base = original price, and Amount = $165. Substituting into the

formula gives, 0.6 x original price = 165. Solving for the original price by dividing both sides of the equation by 0.6 gives $275.

Measurements

11. ANSWER: **c**

Start counting from the decimal point in the smaller unit, 87,000 mm and move 6 spaces to the left until you get to Km. Now move the decimal, in the number 87,000, 6 places to the left also. Since this is a whole number, the decimal is behind the last zero in 87.000 mm. The conversion is equal to 0.087Km.

12. ANSWER: **c**

The two bottles must be in the same metric units. Convert 200ml to liters. Using Figure 5 above, this gives 0.2 L. Therefore, to find the difference, subtract, 0.2 from 3 and get, 2.8 L.

13. ANSWER: **a**

Converting 56.8Kg to pounds, multiplying by 2.2, (1 kg = 2.2 pounds), therefore, Romiin weighs 124.96 pounds. Rounding to the nearest whole number, the answer is 125 lbs.

Geometry

14. ANSWER: **d**

The diameter of the tire is 2 times the radius, which is 34 inches. Using the formula above, C = 3.14 x 34 = 106.76. Rounding 106.76 to the nearest whole number gives 107. So, the circumference of the Lexus tire is 107 inches.

15. ANSWER: **c**

To find the missing side, b, use the Pythagorean theorem formula, $a^2 + b^2 = c^2$. Replace a and c in the formula, with its respective values. Therefore,

$a^2 + b^2 = c^2$

$3^2 + b^2 = 5^2$

$9 + b^2 = 25$ subtract 9 from both sides,

$b^2 = 25 - 9 = 16$, take the square root of both sides,

$b = 4$.

16. ANSWER: **c**

Taking the square root of $\sqrt{169} = \pm 13$. So, the positive root is +13.

17. ANSWER: **c**

To find the perimeter of the polygon, add all sides around the shape. So, P = 4ft+8ft+4ft+4.5ft+14ft+5.6ft= 40.1 ft.

Real Numbers

18. ANSWER: **a**

Translated as a mathematical expression, denoted as,

$8\left(3^2 - 6\right) \div 4$.

Following PEMDAS, $8\left(9 - 6\right) \div 4$,

$8\left(3\right) \div 4$,

$24 \div 4$

6

19. ANSWER: **d**

Following PEMDAS, and look for representation of parentheses, working from left to right, take the square root of 36, take the absolute value of -50, $50 + 6 - \left(-70 + 35\right)$, continuing PEMDAS, left to right you add then subtract,

50 + 6 +35

56 + 35

91

20. ANSWER: **b**

Translated, we have, $\frac{x}{4} + 9$. Since $x = 4, \frac{4}{4} + 9 = 1 + 9 = 10$.

21. ANSWER: **a**

By following orders of operations, and working from left to right, take the square of 4, by multiplying 4 times 4, and the same for 5 squared. Then subtract the two from each other, as follows: 16 – 25 = -9.

22. ANSWER: **d**

Following orders of operations and working in parentheses first, subtracting the fractions gives, 6/6=1. Raising 8/9 to the zero power is 1. So 1 – 1 = 0.

23. ANSWER: **c**

To write in expanded form, is, - 6 x 6 x 6 = - 216. The expanded notation is not (-6)(-6)(-6) = -216. Although the answer is the same, the number is a positive 6 and not a negative 6.

Concepts in Statistics

24. ANSWER: **a**

A frequency table is the answer. It shows the number of times each data occurs by tally marks.

25. ANSWER: **c**

Adding all the values and divide by 5 is 1.7466. This is the mean.

26. ANSWER: **a**

There are no repeated numbers(miles). Thus, there isn't a mode.

27. ANSWER: **d**

The polynomial expression has 4 terms. A polynomial is an algebraic expression that consists of monomials. In this polynomial, there are 4 monomials, therefore has 4 terms.

28. ANSWER: **d**

Using the Addition property of Equality to solve for *x*, add 9(opposite of -9) to both sides. This is a one- step equation, so the solution for *x* = 35.

29. ANSWER: **a**

Using the Addition property of Equality to solve for y, subtract 41(opposite of -41) from both sides. This gives, $41 - 41 - y = 90 - 41$, $-y = 49$, divide both sides by -1. The solution for y = - 49.

30. ANSWER: **d**

Using the Addition property and multiplication property of Equality, this a two-step equation. So,

$7x + 11 = -73$, $7x + 11 - 11 = -73 - 11$, $7x = -84$, $x = -12$.

31. ANSWER: **c**
    Applying the addition rule, add -4y to both sides and add 2 to both sides. This gives 7y = 8, dividing by 7 both sides, gives the solution, y = 8/7

32. ANSWER: **c**
    To be all real number the solution shows the left side of the equal sign is equal to the right side of the equal sign. 0 = 0 shows this fact.

33. ANSWER: **a**
    Translating into an equation, reading from left to right, Let H be Henry and G be Guy. Then the word "is" means equal to and the word twice means to multiply Guy's appetite by 2. H = 2G.

34. ANSWER: **b**
    Since G =2, then 2(2) = 4.

35. ANSWER: **c**
    The graphs show that x has two solutions. $\{x \mid x > -1\}$ and $\{x \mid x \leq 3\}$. An open circle is represented by the inequalities $< and >$. A closed circle is represented by the inequalities $\leq and \geq$.

36. ANSWER: **a**
    This means that the temperature cannot go below 75 and above 95, but is can be any temperature between. Representing the temperature as random variable x, the solution $\{x \mid x > 75\}$ and $\{x \mid x < 95\}$. Both are open circle because the two end points are not included as an allowed temperature.

37. ANSWER: **b**
    Isolate the variable by adding 28 to both sides. $h > 56$. The graph of the inequality will be open since the inequality means "*h is greater than 56*".

Appendix A

This Word Document contains various Math problems created using the MathType software from Design Science. For more details about MathType, please visit: MathType by Design Science.

NVDA Users

NVDA users have a couple of options to help ensure an optimal experience with this document:

- **Option A: Use the web version of the placement tests:**
  RISE Math Placement Test Practice Tests (web version)

- **Option B: Download and install** the free MathPlayer from Design Science. After installing MathPlayer, close and then reopen this document.

JAWS or Fusion Users (and Refreshable Braille Display Users)

1. Make sure you are running JAWS 2019.1904.60 or Fusion 2019.1904.22 or higher along with Microsoft Word from Office 365. Note that
2. Install MathType and activate the software as a trial or actual license.
3. In Settings Center for JAWS, make sure the "Use Accessibility Driver for Screen Capture" check box is selected. To access Settings Center, open Chrome and press **INSERT+F2. ARROW DOWN** to Settings Center and press **ENTER**.

Once you have the above criteria met, you can navigate to the formulas an expressions in this document, and while the cursor is on the formula, press the JAWS layered command: **INSERT+SPACEBAR, =**.

Note: *The first time you do this, there will be a bit of a delay before the Math Viewer (described below) opens. It will be faster on subsequent uses.*

This will put you into a JAWS generated Math Viewer. You can then navigate and press **ENTER** on the various components, drill down into individual sections of the equation using the **ARROW** keys. When you press **UP ARROW**, you will move back one level.

With a refreshable Braille Display, and JAWS set to Contracted English US or UEB, the math equation will also be output in Nemeth for English Language versions.

Using an Older Version of JAWS or Fusion?

Use the web version of the placement tests: RISE Math Placement Test Practice Tests (web version).