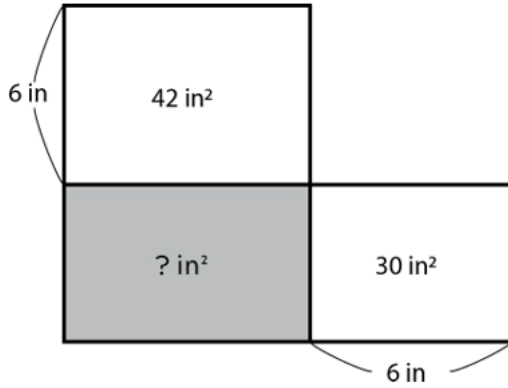


Work the following puzzle by using the equation for area

Area = Base x Height. Solve for ?in<sup>2</sup>



### PUZZLE 1



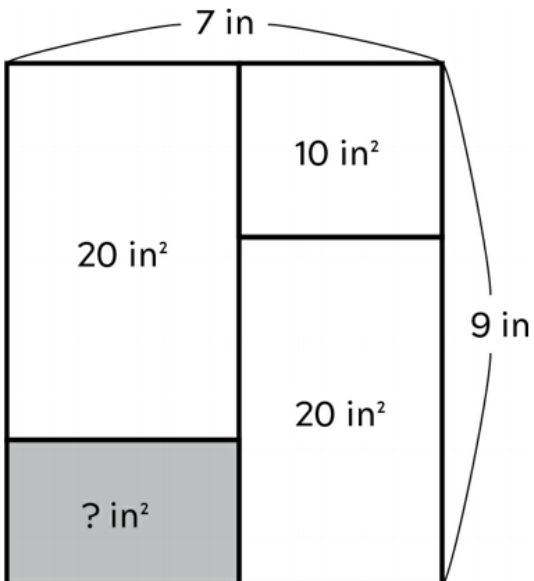
1. \_\_\_\_\_

Work the following puzzle by using the equation for area

Area = Base x Height. Solve for ?in<sup>2</sup>



### PUZZLE 23



2. \_\_\_\_\_

## Motel Hideout

You will use logic to solve for the following puzzle.

A thief hides out in one of the 45 hotel rooms listed in the chart below. The in-house detective received a sheet of four clues, signed "The Logical Thief". Using these clues, the detective found the room. The thief had already escaped can you find these thief's room.

### Clues

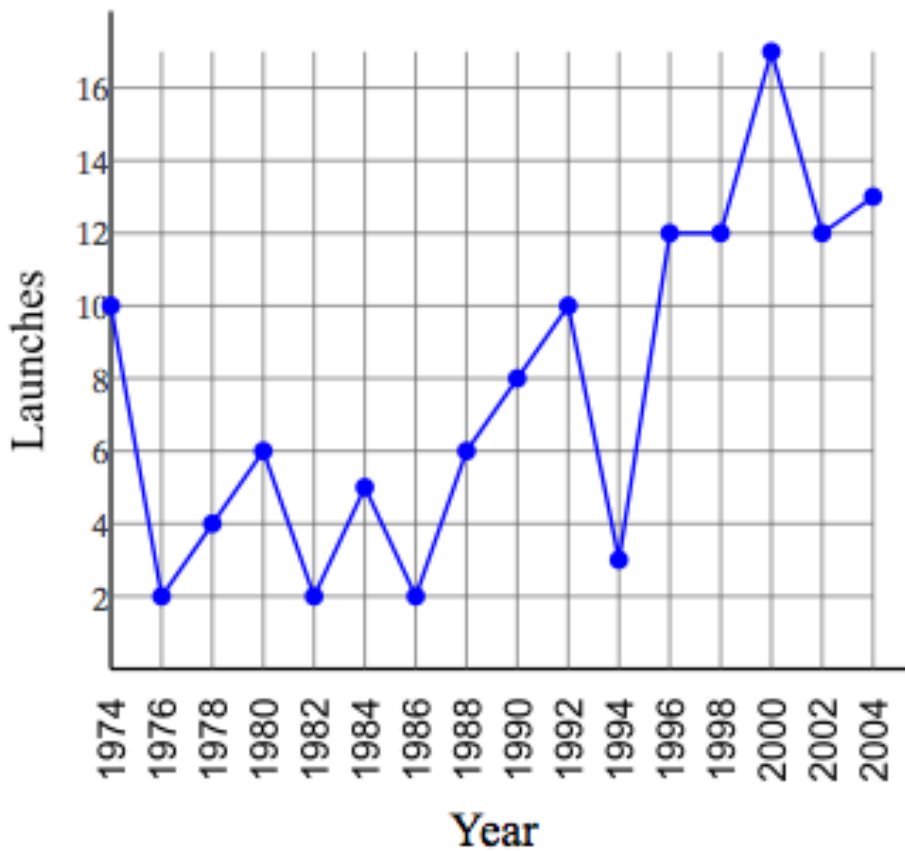
1. Neither digit is 3
2. The sum of the digits is either 5, 7, or 10.
3. If the digits were flipped, the resulting number would be found on the chart.
4. The number is prime.

51	52	53	54	55	56	57	58	59
41	42	43	44	45	46	47	48	49
31	32	33	34	35	36	37	38	39
21	22	23	24	25	26	27	28	29
11	12	13	14	15	16	17	18	19

Answer 3. \_\_\_\_\_

Find the **median**, **mean**, **lower quartile**, **upper quartile**, and **interquartile** range for each data set.

### European Spacecraft Launches



4. median

\_\_\_\_\_

5. mean

\_\_\_\_\_

6. lower quartile

\_\_\_\_\_

7. upper quartile

\_\_\_\_\_

8. interquartile

\_\_\_\_\_

Evaluate each expression.

9)  $(-75) - 99 - 16 + 46$

10.  $20 - (-54) + 16 - 26$

$$11.) \quad 80 - 2 - (-49) - 40$$

$$12.) \quad 0 \div -4$$

Find each quotient.

$$13.) \quad 2\frac{7}{10} \div \frac{-3}{2}$$

$$14.) \quad \frac{9}{8} \div 1\frac{1}{3}$$

$$15.) \quad -32 \div 4$$

Evaluate each expression

$$16.) \quad \frac{29 + 5 + 8}{7}$$

$$17.) \quad (-3) \times (-2) - (-5) \times 9$$

$$18.) \quad 0 \div -4$$

19.) When designing a house the first step should be to?

- a. Look at other houses in different states to gain a perspective of common designs found around the country.
- b. Investigate the local neighborhood where the house will be built to gain insight in to the local demographic.
- c. Use a prefab skeleton structure then just begin adding what you want.
- d. Draw ten different ideas then bring them to potential costumers

20.) Which of the following steps is the most important in the empathetic process?

- a. Ask .
- b. Plan
- c. Imagine
- d. Create

21.) In engineering, the design process begins when...

- a. When information about an existing product is gathered by an engineer.
- b. An engineering design team comes up with a new product.
- c. A design engineer recognizes the need for a solution to a product.
- d. An engineer starts to build his first prototype.

22.) Which step of the engineering design process distinguishes an engineer from a technician?

- a. Construct a prototype
- b. Test and evaluate a prototype
- c. Redesign

23.) The engineering design process is iterative. This allows engineers to

- a. Become proficient at different engineering software applications
- b. Find the most optimal solutions to design a problem
- c. Incorporate both math and science concepts into a design problem
- d. To create a single solution to each problem.

24.) You power-on the controller for your robot. After the controller powers-on, you hear a series of sounds but the LCD display is not illuminated.

Which of the following statements best represents what should be done by the student to troubleshoot the problem?

- a. Read the manual to determine how to adjust the brightness of the LCD display screen.
- b. Order a new display screen.
- c. Put the robot away because you will need to purchase a new robot due to the high cost of developing a solution will be too high.
- d. Give the controller to Mr. Tim to determine the problem

25.) What has one function and very few moving parts?

- a. Simple Machine
- b. System
- c. Precess
- d. Complex machine

26.) What is the return of information back to the information giver about the results of a process or activity.

- a. Feedback
- b. process
- c. Output
- d. Input

27.) What is a series of interconnected parts?

- A. Simple Machine
- b. System
- c. Precess
- d. Complex machine

## **Challenge**

*In this small group activity, your team is to design and develop (invent) a prototype (working model) of a small candy dispenser.*

### **Criteria and Constraints:**

- 1. Your candy dispenser must be made with at least seven different items.*
- 2. You must decide on a name for your candy dispenser*
- 3. The candy dispenser must be able to hold four ounces of candy and be able to dispense a small “free sample” of approximately 4 to 8 pieces of candy.*
- 4. You may not use glass*
- 5. You may not use any materials that pose a safety problem.*

### **Tools, Material, and Equipment Needed:**

- 3 straws*
- 1 bowl*
- 1 CD*
- Tape*
- 2 paperclips*
- 1 cup*
- 2 pipe cleaners*
- 2 rubber bands*
- 1 file folder*



28.) Which of the following best represents what will occur during step three of the engineering design process as you develop the candy dispenser?

- a. List the criteria for the candy dispenser
- b. Research different candy dispensers using the internet
- c. Draw various sketches of possible solutions of the candy dispenser.
- d. Develop the prototype for the candy dispenser.

29.) Which statement best describes the problem in the scenario?

- a. Your candy dispenser must be made with at least seven different items.
- b. Your aunt has made several different flavors of candy
- c. Your aunt needs someone to invent a candy dispenser for her
- d. None of these

30.) Which of the following choices would be considered a constraint

- a. Dispense free samples
- b. 1 bowl
- c. No items that can create a safety hazard
- d. 2 pipe cleaners
- e. Must be made with no less than seven different items.

<b>TERMS YOU NEED TO KNOW.</b>	Write your definition here.	Write a memory his to help with your unstersqnding of the term.
<b>SENSOR</b>		
<b>PRGRAMMING</b>		
<b>ULTRASONIC SOUND WAVES</b>		
<b>GYROSCOPE</b>		
<b>DEGREES OF TURN</b>		
<b>BUMBER SWITCH</b>		
<b>TOUCH LED</b>		
<b>DISTANCE SENSOR</b>		
<b>COLOR SENSOR</b>		
<b>SMART MOTOR</b>		
<b>CODING</b>		
<b>SOFTWARE</b>		
<b>ENGINEERING PROCESS</b>		
<b>VIRIABLES</b>		
<b>DATA</b>		
<b>CONTROL GROUP</b>		
<b>INDEPENDENT VARIABLE</b>		
<b>DEPENDENT VARIABLE</b>		
<b>GUIDING QUESTION</b>		
<b>HYPOTHESIS</b>		

<b>TERMS YOU NEED TO KNOW.</b>	<b>Write your definition here.</b>	<b>Write a memory his to help with your unstersqnding of the term.</b>
<b>QUANTITATIVE OBSERVATION</b>		
<b>QUALITATIVE OBSERVATION</b>		
<b>ANALYSIS</b>		
<b>LINE GRAPH</b>		
<b>BAR GRAPH</b>		
<b>X, Y, INTERCEPT</b>		
<b>G CODE</b>		
<b>C CODE</b>		
<b>BLOCK CODE</b>		

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