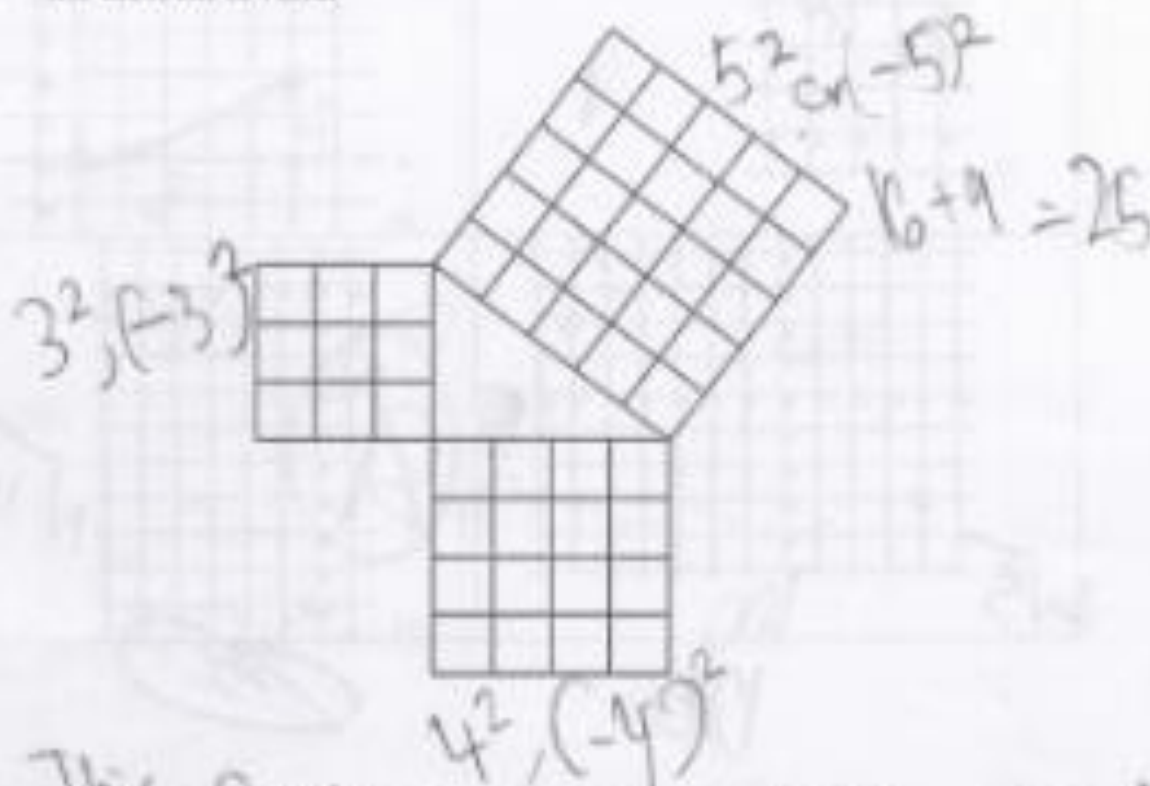


Unit BC Test

1. (G6 - I can prove the Pythagorean Theorem) Use the graphic below and explain its connection to the Pythagorean Theorem, as one form of proof that the theorem is valid.



This graphic below ~~relates~~ connects to Pythagorean theorem because the space in between the coordinates is a right triangle. That right triangle allows Pythagorean Theorem.

2. (EE2 - I can solve simple exponential equations) Solve each equation.

Show your work on a separate sheet of paper. Be sure to identify positive and negative solutions when applicable.

a. $M^2 - 56 = 0$

b. $N^2 + 4 = 40$

c. $-10 - 5x^2 = -330$

d. $Y^2 + 64 = 0$

e. $4x^2 + 24 = 159 - x^2$

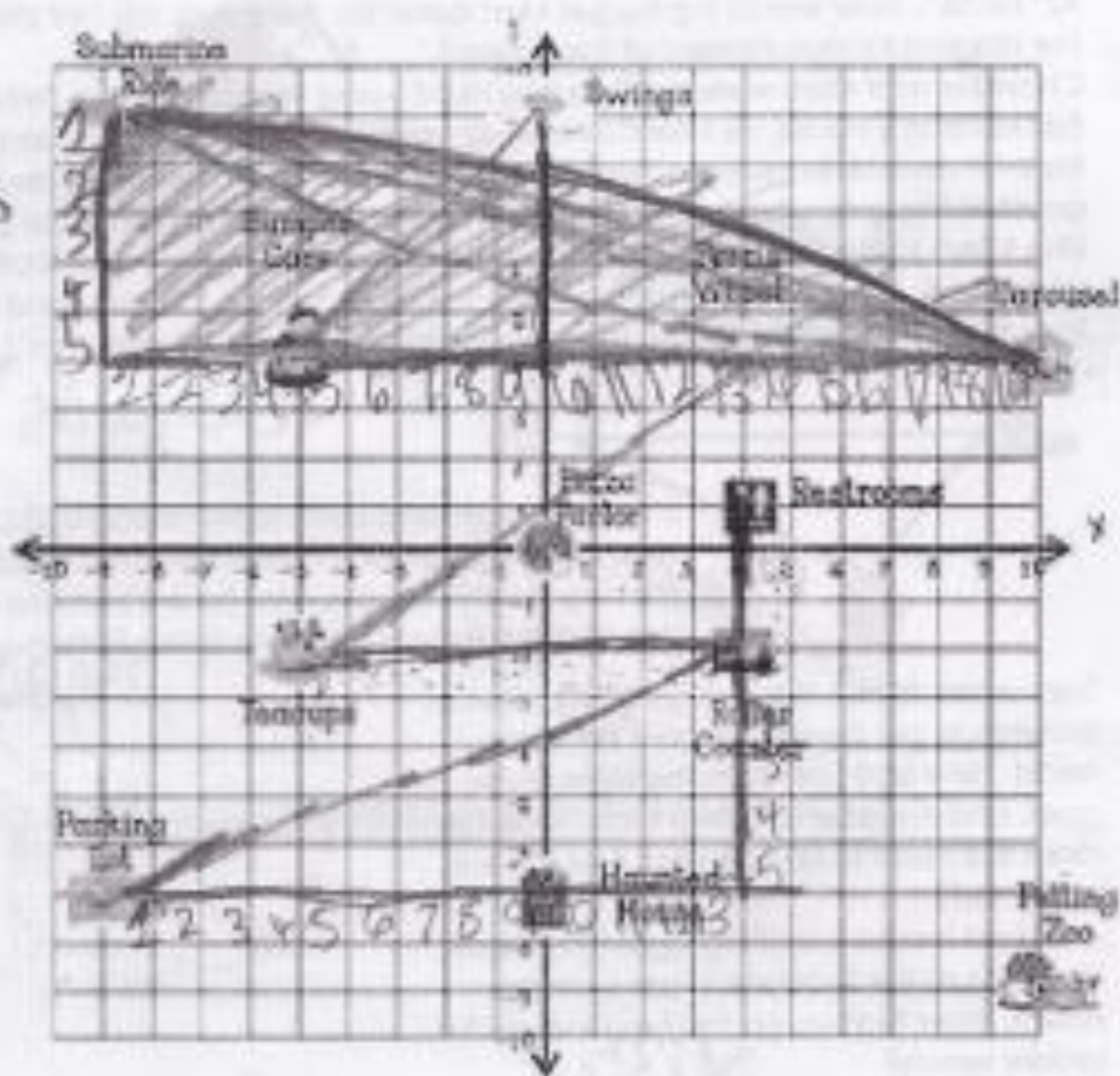
$M = 7.48, -7.48$
 $N = 6, -6$
 $x = 8, 8$
 $Y = 4$
 $x = 3$

4. In the map below, one block equals 10 yards. Find the straight-line distance between each. The coordinates for each object are based on the center of each picture.

- Tentcups to Restrooms
- Bumper Cars to Swings
- Parking Lot to Roller Coaster
- Submarine Ride to Carousel

Handwritten calculations:
 $10\sqrt{13}$
 $10\sqrt{50}$
 $10\sqrt{144}$
 $10\sqrt{386}$

Handwritten note: 2500



20. A basketball has a diameter of 29.5 inches. If the basketball is fully inflated, about how many cubic inches of air will it hold? Use 3.14 for π . Show your work. (69)

$$\begin{array}{r}
 + 3209.04865 \\
 \hline
 1004.882249667 \\
 \hline
 13,435. \text{ Inch}^3
 \end{array}$$

(3D) Gift Box Dilemma

You must answer & show work for all parts for credit.

Sam just purchased a candle to give to his mom as a birthday gift. Unfortunately, he has no box to put it in. Sam knows that he can make a box using tape and cardboard.

If he cuts the cardboard as shown below, he can fold and tape to make this box.



- A) Sam's candle is 5 inches tall and has a radius of 1.5 inches. Draw a plan for his box below.



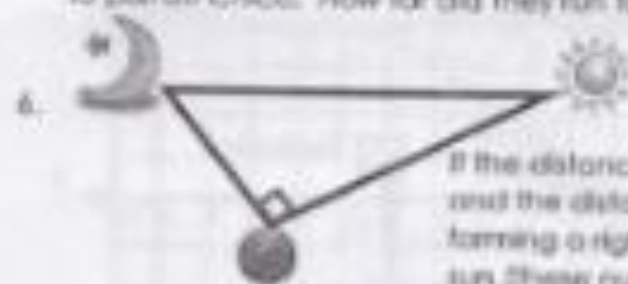
$$\begin{array}{l}
 \text{Work} \\
 \pi \times 1.5^2 \times 3.14 = 35.325 \\
 \text{Work}
 \end{array}$$

- B) What is the volume of the smallest box Sam could build to hold the candle? Show the mathematics you used to determine your answer. Volume for the box = Bh

$$\begin{array}{l}
 35.325 \div 2 = 17.6625 \\
 \text{Work} \\
 36 \text{ inch}^3
 \end{array}$$

(G7 - I can apply the Pythagorean Theorem to solve real world problems)

1. The legs of a scalene right triangle are 11 feet and 19 feet, respectively. What is the length of the third side? $\sqrt{500}$
2. Chad and Bryan are designing a flag for the new country they are planning to form, called Chyanapolis. The width of the flag is 2 feet, and the diagonal measurement is 5 feet. What is the length of the other side of the flag? $\sqrt{21}$
3. Dylan's house is 140 feet due east of Bubba's Bounce's Soul Sam. Henry's Hippo Hideaway (a sanctuary for troubled hippos) is 200 feet south of Bubba's. If Dylan is at his house and releases his blackbird, Benny, and it flies in a straight line through the air to land on the back of a hippo at Henry's, how far did Benny fly? $\sqrt{19600}$
4. Big Fergal Mart sells lots of TVs. One of the largest they sell has side dimensions of 42" by 36". How would Big Fergal Mart advertise the size of the TV? (This would be the diagonal measurement of the screen). $\sqrt{3060}$
5. Chandler and Allen were out late one night taping teacher's trees. While at Mr. Edmondson's house, his killer Chihuahua named Chico started chasing them. They took off due south (going downhill) and ran 80 yards. They turned and ran east another 80 yards, where they ran into a big fenced yard and shut the gate. Chico (the killer) started digging under the gate. Chandler and Allen took off in a direct route to Mr. Edmondson's house where they knocked on the door and begged him to pull off Chico. How far did they run to get back to Mr. Edmondson's house?



If the distance from Earth to the moon is 525,000 miles, and the distance from Earth to the Sun is 725,000 miles, forming a right triangle, how far is it from the moon to the sun (these numbers are completely fictitious).

7. Suzy wants to kick the soccer ball as high as possible to get it over the goal keeper's head. She is 20 feet from the front of the goal, and the goal is 15 feet high. How far does she need to kick it to get it at the top of the net? 25
8. A 12 foot ladder is leaning against a house. The base of the ladder is 3 feet from the house. How high up on the house does the ladder reach? $\sqrt{35}$
9. The legs of a right triangle are 300 cm and 400 cm respectively. How long is the hypotenuse? 500 cm
10. A car is headed up a ramp into a parking garage. The ramp is 500 feet long, and covers a horizontal distance of 400 feet. When the car reaches the end of the ramp, how far up vertically is the car from where it started? 300 ft



300 ft

3. (G8 - I can apply the distance formula or Pythagorean Theorem in the coordinate plane to find distances between points)

