# ANIMAL WRANGLING

The Zoological Swagg Society (ZSS for short) have decided to build the first real deal 22nd Century zoo. The ZSS believes opening a 22nd Century Zoo will give them a leg up on their competition. The ZSS hope to perfectly mesh traditional zoo features with modern swagg. As an applicant for the position Zoo Swagg Engineer (or Zoo Designer in plain English), you will be required to prove your competence in all thing Zoo. The ZSS believe it's critical for their success to have animals that are the happiest in the history of the universe so they need exhibit spaces that meets their needs. The ZSS doesn't have a lot of money (in fact they're kind of broke) so they are also interested in using as little fencing as possible.

In this assignment, you must have strong Area and Perimeter skills to meet the needs of some potential new animals. **Each square in the grid represents 625 ft$^2$, so each line segment represents 25 ft**. Draw and label diagrams (with dimensions and area) for each animal on the grid. If your exhibits are too small, the animals will escape, if they are too big, you are using too much money! LET'S START WITH AREA...

Name _____

Date _____

Period _____

**BISON**

GRASSLANDS / TEMPERATE FOREST

Needs 20,000 ft$^2$ of space

**MOOSE**

GRASSLANDS / TEMPERATE FOREST

Needs 28,125 ft$^2$ of space

# CREATE A PERIMETER!

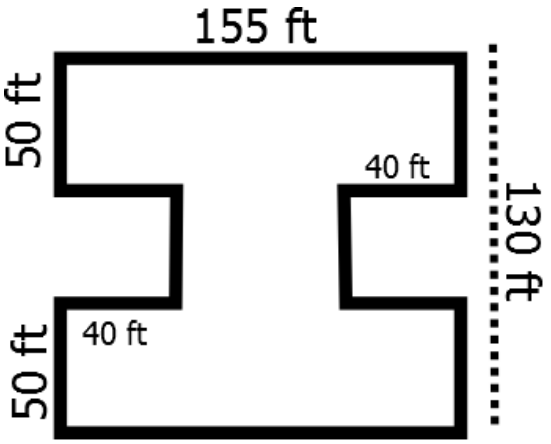
In addition to area, perimeter is a concern since fencing resources are limited!

As a reminder, each square in the grid represents 625 $ft^2$, so each line segment represents 25 ft. Draw and label diagrams (<u>with dimensions and area</u>) for each animal on the grid.


Must use 800 ft of fencing.

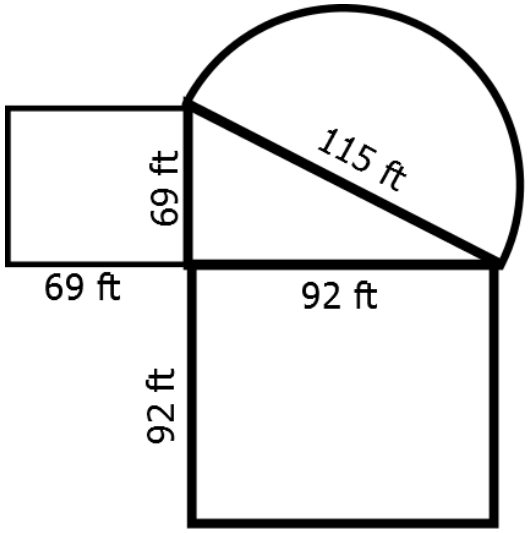

Must use 550 ft of fencing.

**IRREGULAR TIME!** In each exhibit below the shapes are composed of common polygons. It may be helpful to add additional lines. **Calculate the areas of the exhibits below and match them to the animal that could be most well accommodated.** Remember, don't choose spaces too small or they'll escape!




TOTAL AREA

BEST SUITED FOR:




TOTAL AREA

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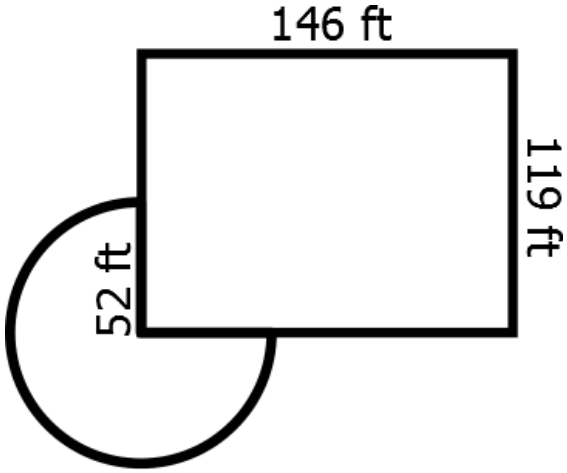
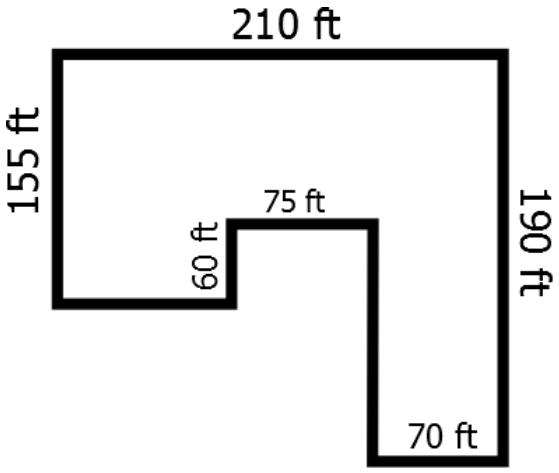



TOTAL AREA

BEST SUITED FOR:




TOTAL AREA

BEST SUITED FOR:

## SPECIES LIST

**PENGUIN**

Needs a space of 17,500 $ft^2$

**GREAT HORNED OWL**

Needs a space of 21,500 $ft^2$

**WALRUS**

Needs a space of 23,500 $ft^2$

**MOOSE**

Needs a space of 28,125 $ft^2$

# DESIGN A ZOO

It's time to put the geometry skills to the ultimate test, the Zoological Swagg Society (ZSS) have chosen you to create the plans and select the animals for their zoo! Overwhelmed?! You should be. Fortunately, the ZSS found a local math teacher to create a series of worksheets and write directions to make you feel comfortable.

In this project, the goal is to create a zoo that will generate the most revenue, but stays under budget. After animals are selected and buildings are built, your choices will be put to the ultimate test to see what the outcome is.

Name

Date

Period

## DIRECTIONS

1. The ZSS has set a $2,000,000 budget for animals purchase and for exhibit construction. While it is not required to purchase any specific animals, it is required that you build restrooms and a concession stand. The ZSS has nearly 1,000,000 $ft^2$ of land to develop which can be seen on the *Zoo Map*. The land is not a geometric shape so things may not fit perfectly. Be mindful of this.

2. When selecting animals you must purchase a minimum to satisfy the requirements for a family group. This will require larger exhibits in all cases. Use the *Species List* for information about the animals and write your decisions on the *Acquisitions Purchase Order.*

3. After selecting animals you must make sure that you have exhibits that satisfy their space needs. Use the *Exhibit Catalog* to research the types of exhibits that can be purchased and write your decisions on the *Architecture Purchase Order*. There is a section of "Special Themed Exhibit Buildings". In these buildings, you can house more than one species that are united by a theme (Habitat or Continent). The buildings are cheaper to build than separate exhibits, but will require more space. **Make sure you have enough space in your zoo to build all the buildings!**

4. Using a blank *Zoo Map*, sketch and label the buildings you have purchased on to it (they are to scale on the Exhibit Catalog). Be sure to draw concrete paths from exhibit to exhibit. If you have purchased exhibits that do not fit in your plans, these buildings and the animals who were to be housed in them, must be returned **with no refund**.

5. On a seperate piece of paper, calculate the perimeter of enclosures A., C. F., H. and J.

6. For Enclosures A, C and F, you need to convert each side length from feet to inches, THEN inches to metres and THEN finally metres to centimeters.

# SPECIES LIST

7. LAND MAMMALS

| Species | Habitat | World Region | Space Required for First Animal | Space Required for each additional animal | Family Group Size (Minimum) | Total Cost (Per Animal) |
|---|---|---|---|---|---|---|
| Beaver | Temperate Forest | North America | 35,000 | 5,000 | 1 | 1,000 |
| Bison | Grasslands | North America | 20,000 | 5,000 | 2 | 1,250 |
| Camel | Desert | Africa | 35,000 | 5,000 | 1 | 1,250 |
| Cheetah | Savanna | Africa | 45,000 | 15,000 | 2 | 7,500 |
| Chimpanzee | Tropics | Africa | 25,000 | 2,500 | 4 | 15,000 |
| Deer | Temperate Forest | North America | 35,000 | 10,000 | 2 | 7,500 |
| Elephant | Savanna | Africa | 42,500 | 10,000 | 2 | 20,000 |
| Giraffe | Savanna | Africa | 35,000 | 5,000 | 2 | 24,000 |
| Gorilla | Tropics | Africa | 35,000 | 5,000 | 4 | 20,000 |
| Grizzly Bear | Temperate Forest | North America | 40,000 | 10,000 | 1 | 15,000 |
| Hippopotamus | Savanna | Africa | 32,500 | 5,000 | 1 | 7,500 |
| Kangaroo | Grasslands | Australia | 35,000 | 2,500 | 6 | 3,000 |
| Koala | Temperate Forest | Australia | 15,000 | 2,500 | 1 | 7,500 |
| Llama | Grasslands | South America | 32,500 | 2,500 | 2 | 2,000 |
| Lion | Savanna | Africa | 25,000 | 7,500 | 4 | 7,500 |
| Meerkat | Savanna | Africa | 15,000 | 5,000 | 12 | 750 |
| Moose | Temperate Forest | North America | 28,125 | 5,000 | 4 | 1,250 |
| Orangutan | Tropics | Asia | 25,000 | 2,500 | 4 | 3,500 |
| Panda | Temperate Forest | Asia | 40,000 | 10,000 | 2 | 40,000 |
| Polar Bear | Tundra | Arctic | 40,000 | 10,000 | 4 | 10,000 |
| Rhinoceros | Savanna | Africa | 40,000 | 12,500 | 1 | 18,000 |
| Tiger | Tropics | Asia | 37,500 | 10,000 | 2 | 15,000 |
| Warthog | Savanna | Africa | 25,000 | 5,000 | 1 | 10,000 |
| Wolf | Temperate Forest | North America | 22,500 | 5,000 | 4 | 7,500 |
| Zebra | Savanna | Africa | 25,000 | 2,500 | 4 | 3,000 |

8.

## REPTILES & AMPHIBIANS

| Species | Habitat | World Region | Space Required for First Animal | Space Required for each additional animal | Family Group Size (Minimum) | Total Cost (Per Animal) |
|---|---|---|---|---|---|---|
| Crocodile | Savanna | Africa | 15,000 | 7,500 | 1 | 3,000 |
| Galapagos Tortoise | Desert | South America | 15,000 | 7,500 | 1 | 3,500 |
| Iguana | Temperate Forest | North America | 7,500 | 1,000 | 1 | 1,500 |
| King Cobra | Temperate Forest | North America | 5,000 | 500 | 1 | 5,000 |
| Komodo Dragon | Desert | Asia | 20,000 | 7,500 | 1 | 5,500 |

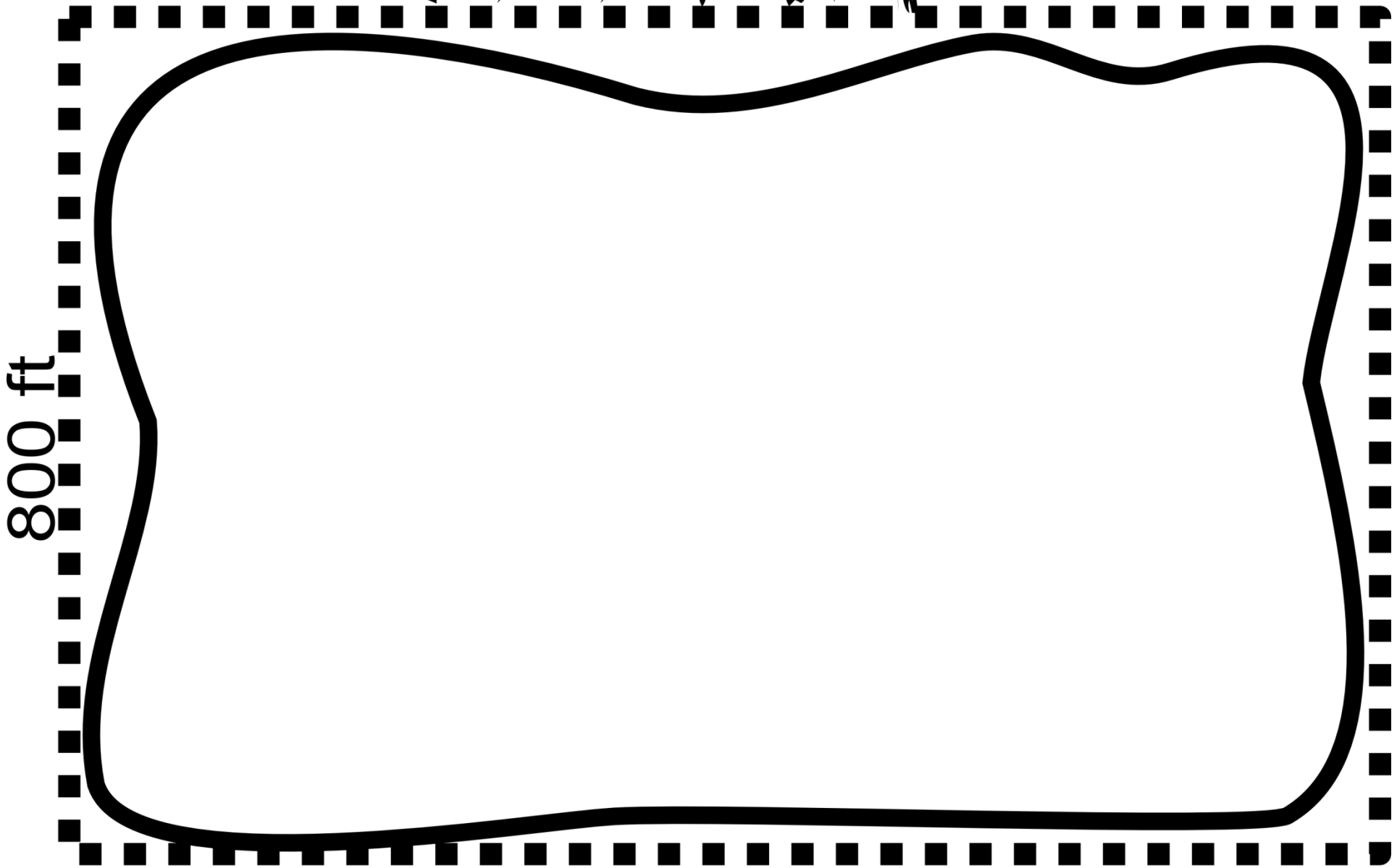
## BIRDS

| Species | Habitat | World Region | Space Required for First Animal | Space Required for each additional animal | Family Group Size (Minimum) | Total Cost (Per Animal) |
|---|---|---|---|---|---|---|
| Eagle | Temperate Forest | North America | 40,000 | 5,000 | 2 | 8,000 |
| Flamingo | Tropics | Africa | 25,000 | 2,500 | 8 | 2,000 |
| Great Horned Owl | Temperate Forest | North America | 21,500 | 2,500 | 1 | 2,500 |
| Ostrich | Savanna | Africa | 26,250 | 2,500 | 2 | 5,500 |
| Penguin | Tundra | Antarctic | 17,500 | 2,500 | 8 | 2,000 |

## MARINE ANIMALS

| Species | Habitat | World Region | Space Required for First Animal | Space Required for each additional animal | Family Group Size (Minimum) | Total Cost (Per Animal) |
|---|---|---|---|---|---|---|
| Dolphin | Tropics | World Ocean | 25,000 | 7,500 | 4 | 25,000 |
| Hammerhead Shark | Tropics | World Ocean | 37,500 | 7,500 | 1 | 20,000 |
| Manatee | Tropics | World Ocean | 40,000 | 12,500 | 2 | 6,000 |
| Manta Ray | Tropics | World Ocean | 17,500 | 5,000 | 2 | 1,250 |
| Marlin | Tropics | World Ocean | 25,000 | 7,500 | 1 | 2,000 |
| Orca | Tropics | World Ocean | 45,000 | 15,000 | 2 | 50,000 |
| Otter | Temperate | North America | 15,000 | 7,500 | 2 | 7,500 |
| Sea Turtle | Tropics | World Ocean | 7,500 | 5,000 | 1 | 2,000 |
| Walrus | Tundra | Arctic | 23,500 | 10,000 | 1 | 35,000 |
| White Shark | Tropics | World Ocean | 37,500 | 12,500 | 1 | 45,000 |

# ZOO MAP



# ACQUISITIONS

# Purchase Order

| | | | | | Space Required | | Totals | |
|---|---|---|---|---|---|---|---|---|
| Species | Habitat / Continent | Required Family Group Size | Quantity Desired | Cost Per Animal ($) | for the first animal ($ft^2$) | for each extra animal ($ft^2$) | Total Space Needed ($ft^2$) | Total Cost ($) |
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| | | | | Total Space Required | | | | |
| | | | | Total Cost | | | | |

# ARCHITECTURE

# Purchase Order

| Building to Purchase (A – J) | Animal(s) to be Housed (If it is Building H, I or J, write the theme of the building) | Total Square Footage of Animals in the Building ($ft^2$) | Square Footage of the Building ($ft^2$) | Cost ($) |
|---|---|---|---|---|
| D | Restrooms | N/A | 5,781 | 50,000 |
| D | Concession Stand | N/A | 5,781 | 50,000 |
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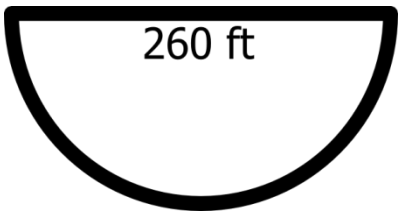
| | | Total Space | | |
| | | Total Cost | | |

# EXHIBIT CATALOG

In order to house the animals at your zoo, you may choose from the designs below. At the bottom, you will see a section of "Special Themed Exhibit Buildings". In these buildings, you can house more than one species that are united by a theme (Habitat or Continent). The buildings are cheaper to build than separate exhibits, but will require more space. Calculate the areas of the exhibits below to make sure they fit!

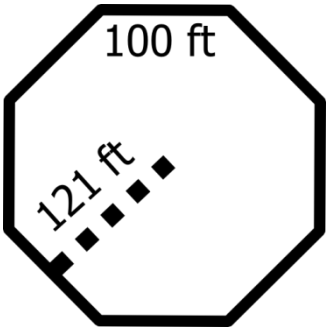
### A. $120,000



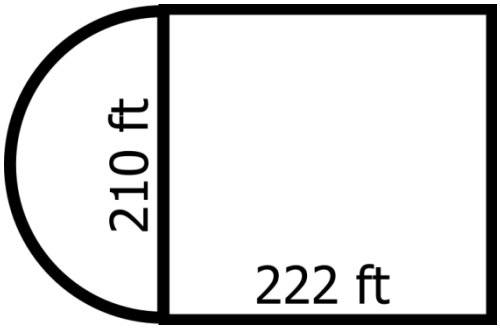

### C. $105,000


### D. $50,000

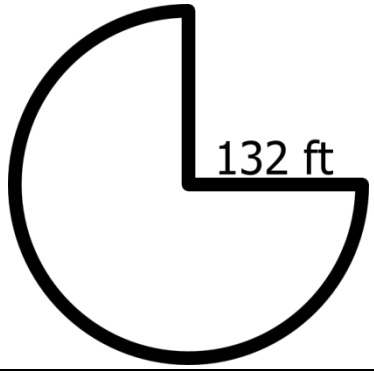

### E. $135,000




### F. $145,000

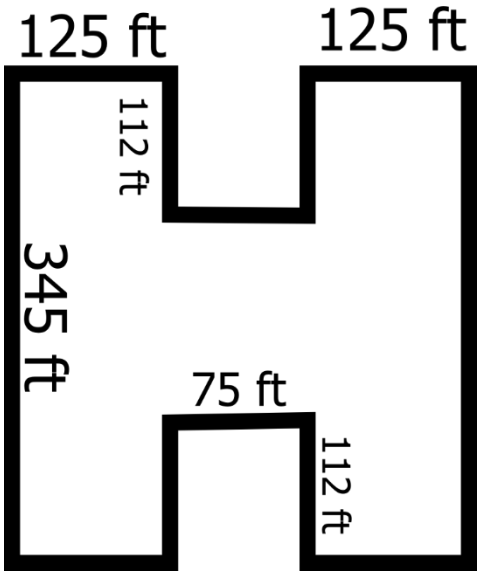



### G. $130,000

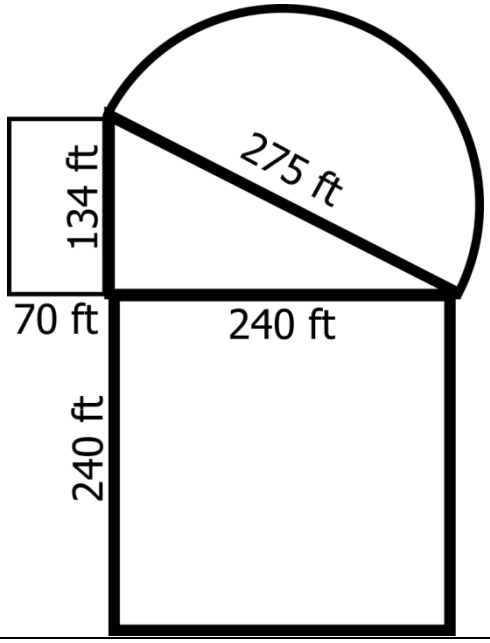



## SPECIAL THEMED EXHIBIT BUILDINGS

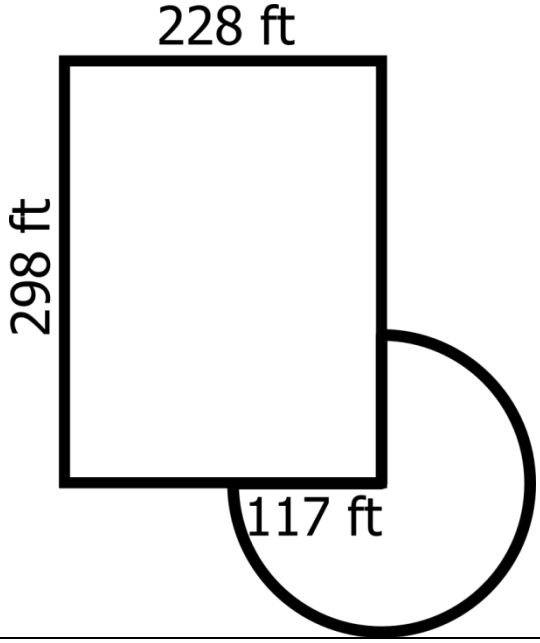
### H. $225,000




### I. $300,000




### J. $275,000



# REQUIREMENTS

Individual or team grades for the project will be broken into the following components:

## 30 pts — Mathematical Precision

| | |
|---|---|
| forms are completed accurately | _____/10 pts |
| exhibits are calculated with correct areas | _____/10 pts |
| diagrams drawn to scale | _____/10 pts |

## 20 pts — Product

| | |
|---|---|
| The final product is precisely to scale and built with great meticulousness and attention to detail. | 20 pts |
| The final product is mostly to scale and created with some attention to detail. | 15 pts |
| The final product is inconsistently to scale or craftsmanship shows uneven effort. | 10 pts |
| The final product is not to scale or created in a careless way. | ___ pts |
| The final product is not complete. | 0 pts |

Total _____/50