winmath
Career Infused Capstone Projects

Name

Box It up

NOTE: ***View all scenarios at the back of this Final Report project for additional package specifications.***

These questions are for Scenario 1. If your project involves a different scenario, answer only the questions for your scenario.

Question 1 - Scenario 1: The Very Best Pasta Company

a. Use graph paper to make a diagram of the net for a box with a volume between 400 and 410 cubic inches and sides that accommodate the shapes listed in the Additional Package Specifications.

- Use a scale of ¼" = 1 ½"
- On your diagram, give the scale, the actual dimensions, the volume, and the surface area of the package.

b. Write a paragraph that includes the following information:

- what will be packaged in your container;
- the client's requirements;
- the dimensions of the box you designed to meet the client's requirements; and
- the process you used to design the package and how you know it meets the client's requirements.

Question 2 - Scenario 1: The Very Best Pasta Company

a. Use graph paper to make a scale drawing to show how many of your nets can be placed on a 42- in by 42-inch sheet of raw material. Use a scale of ¼" = 1 ½". Position your nets to use as much of the raw material as possible. Calculate the amount of scrap (left over raw material). On your diagram, include:

- the scale;
- the actual dimensions of the raw material; t
- he actual dimensions, volume, and surface area of the box; and
- the amount of scrap for the configuration you chose.

b. Explain your reasoning for the placement of the nets. Show or explain your calculations that indicate the amount of scrap your solution would generate.

Question 3 - Scenario 1: The Very Best Pasta Company

a. Compute the area of each shape that will be printed on your box.

Use graph paper to make a scale drawing of each face (6 sketches all together). Use a scale of ¼" = ½". The lower left corner of each face should be at the origin (0, 0).

Make scale drawings of each shape on the faces. Use letters to label the vertices of each shape. On your diagram, list the coordinates of each point and the area of each shape. Label your drawings with the dimensions of the faces. Click the Sample Answer icon to see a sample diagram.

b. Use the coordinates of each point to describe the position of each shape on the faces. Use the area of the shapes and the surface area of the box to explain:

- how you decided where to put the shapes on the faces of your box; and
- how you know the shapes will fit on each face.

NOTE: ***View all scenarios at the back of this Final Report Project.***

These questions are for Scenario 2. If your project involves a different scenario, answer only the questions for your scenario.

Question 1 - Scenario 2: Dee-licious Bakeware

a. Use graph paper to make a diagram of the net for a box with a volume of 990 to 1000 cubic inches and sides that accommodate the shapes listed in the Additional Package Specifications.

- Use a scale of ¼" = 1.5 centimeters.
- On your diagram, give the scale, the actual dimensions, the volume, and the surface area of the package.

b. Write a paragraph that includes the following information:

- what will be packaged in your container;
- the client's requirements;
- the dimensions of the box you designed to meet the client's requirements; and
- the process you used to design the package and how you know it meets the client's requirements.

Question 2 - Scenario 2: Dee-licious Bakeware

a. Use graph paper to make a scale drawing to show how many of your nets can be placed on a 42-cemtimeter by 51-centimeter sheet of raw material. Use a scale of ¼" = 1.5 centimeters Position your nets to use as much of the raw material as possible. Calculate the amount of scrap (left over raw material). On your diagram, include:

- the scale;
- the actual dimensions of the raw material;
- the actual dimensions, volume, and surface area of the box; and
- the amount of scrap for the configuration you chose.

b. Explain your reasoning for the placement of the nets. Show or explain your calculations that indicate the amount of scrap your solution would generate.

Question 3 - Scenario 2: Dee-licious Bakeware

a. Compute the area of each shape that will be printed on your box.

Use graph paper to make a scale drawing of each face (6 sketches all together). Use a scale of ¼"= 1 centimeter. The lower left corner of each face should be at the origin (0, 0).

Make scale drawings of each shape on the faces. Use letters to label the vertices of each shape. On your diagram, list the coordinates of each point and the area of each shape. Label your drawings with the dimensions of the faces. Click the Sample Answer icon to see a sample diagram.

b. Use the coordinates of each point to describe the position of each shape on the faces. Use the area of the shapes and the surface area of the box to explain:

- how you decided where to put the shapes on the faces of your box; and
- how you know the shapes will fit on each face.

NOTE: ***View all scenarios at the back of this Final Report Project.***

These questions are for Scenario 3. If your project involves a different scenario, answer only the questions for your scenario.

Question 1 - Scenario 3: Transcontinental Toys

a. Use graph paper to make a diagram of the net for a box with a volume of 1415 to 1420 cubic inches and sides that accommodate the shapes listed in the Additional Package Specifications.

- Use a scale of ¼" = 1 ½".
- On your diagram, give the scale, the actual dimensions, the volume, and the surface area of the package.

b. Write a paragraph that includes the following information:

- what will be packaged in your container;
- the client's requirements;
- the dimensions of the box you designed to meet the client's requirements; and
- the process you used to design the package and how you know it meets the client's requirements.

Question 2 - Scenario 3: Transcontinental Toys

a. Use graph paper to make a scale drawing to show how many of your nets can be placed on a 57-inch by 43.5-inch sheet of raw material. Use a scale of ¼" = 1 ½". Position your nets to use as much of the raw material as possible. Calculate the amount of scrap (left over raw material). On your diagram, include:

- the scale;
- the actual dimensions of the raw material;
- the actual dimensions, volume, and surface area of the box; and
- the amount of scrap for the configuration you chose.

b. Explain your reasoning for the placement of the nets. Show or explain your calculations that indicate the amount of scrap your solution would generate.

Question 3 - Scenario 3: Transcontinental Toys

a. Compute the area of each shape that will be printed on your box.

Use graph paper to make a scale drawing of each face (6 sketches all together). Use a scale of ¼" = ½". The lower left corner of each face should be at the origin (0, 0).

Make scale drawings of each shape on the faces. Use letters to label the vertices of each shape. On your diagram, list the coordinates of each point and the area of each shape. Label your drawings with the dimensions of the faces. Click the Sample Answer icon to see a sample diagram.

b. Use the coordinates of each point to describe the position of each shape on the faces. Use the area of the shapes and the surface area of the box to explain:

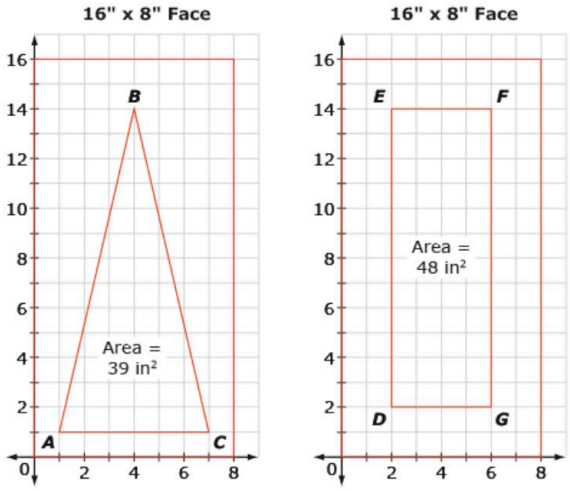
- how you decided where to put the shapes on the faces of your box; and
- how you know the shapes will fit on each face.

Scenario 1 - Sample Answers for Question 3

BOX IT UP
Sample Answer

Sample Drawing of Two Faces with Shapes on the Faces

Scale: $\frac{1}{4}$" = 1"



A = (1, 1)
B = (4, 14)
C = (7, 1)

D = (2, 2)
E = (2, 14)
F = (6, 14)
G = (6, 2)

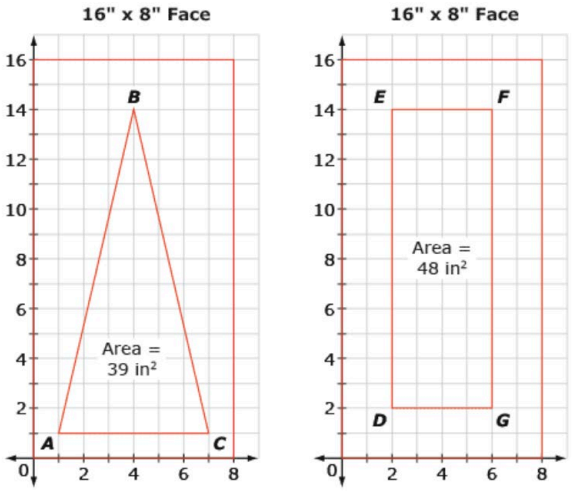
NOTE: Dimensions shown in the sample drawing will not match the dimensions of your box.

Scenario 2 - Sample Answers for Question 3

BOX IT UP
Sample Answer

Sample Drawing of Two Faces with Shapes on the Faces

Scale: $\frac{1}{4}$" = 1"



A = (1, 1)
B = (4, 14)
C = (7, 1)

D = (2, 2)
E = (2, 14)
F = (6, 14)
G = (6, 2)

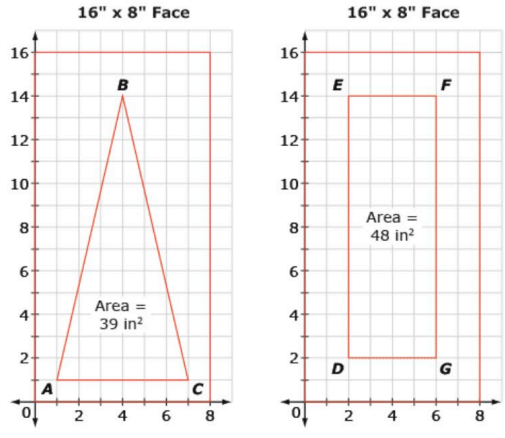
NOTE: Dimensions shown in the sample drawing will not match the dimensions of your box.

Scenario 3 - Sample Answers for Question 3

BOX IT UP
Sample Answer

Sample Drawing of Two Faces with Shapes on the Faces

Scale: $\frac{1}{4}$" = 1"



A = (1, 1)
B = (4, 14)
C = (7, 1)

D = (2, 2)
E = (2, 14)
F = (6, 14)
G = (6, 2)

NOTE: Dimensions shown in the sample drawing will not match the dimensions of your box.

The Very Best Pasta Company
Additional Package Specifications

The Very Best Pasta Company wants to place several graphics on the new package, including the company's triangular logo, some artwork, an ingredients list, cooking directions, and a seal of approval from the Organic Foods Monitors. They also want to position the pattern for the rectangular prism so that multiple copies can be cut from the same piece of raw material. Your proposal should include diagrams and explanations for the following specifications.

The surface area of faces must be large enough to print the following shapes on the box.

- a trapezoid with bases of 13.5 inches and 10.5 inches and a height of 5.25 inches
- a solid arrow with a length of 14.25 inches and a maximum width of 3.75 inches
- an isosceles triangle with a base of 6 inches and a height of 13.5 inches
- a square with sides of 4.5 inches
- a rectangle with a length of 3 inches and a width of 12.75 inches
- a right triangle with a base of 4.5 inches and a height of 5.25 inches

As a product designer, you have to present your design and calculations to the executive board of the company you work for. The executive board will want to know all the details of the product packaging, design, and use of raw materials. Use the calculations and graph paper nets you've already designed to prepare for your presentation.

1. You may choose to:

Create a slideshow to present your work. The executive board is very curious about what their product will look like in your design, so you should create a visually interesting slideshow to accompany your presentation. You should include your calculations and answers to the written questions as part of the presentation. The visuals in the slideshow should clearly present your design, along with any measurements, and raw materials information required in the questions at right. Present the slideshow to the class, electing a few classmates to serve as the executive board.

2. Build a 3-D model of your work.

After completing your calculations and designing your product on paper, build a scale model to bring to your presentation with the executive board. The board will want to be sure that all their requirements were met, so you will need to create a hand-out or flipchart poster along with the model. Your hand-out or poster should include measurements, design specifics, and information about raw materials as calculated in the questions to the right.

OR

3. Be creative!

Design your own way to present your product design to the executive board of the company that you are working with. As the product designer you are the expert and creative force behind the design. Remember, your presentation or project should include the calculations and answers to the questions and requirements posed by the company.

Dee-licious Bakeware
Additional Package Specifications

Dee-licious Bakeware has several other requirements for this project. Design a container that can hold the required volume and can accommodate graphics that show the company logo, artwork, usage instructions, and other information.

The surface area of faces must be large enough to print the following shapes on the box.

- an isosceles triangle with a base of 6 centimeters and a height of 27.25 centimeters
- two right triangles, each with a base of 6 centimeters and a height of 6 centimeters
- an arrow with a length of 27.75 centimeters and a maximum width of 5 centimeters
- 2 squares, 5 centimeters on each side, placed so they have one side in common
- a trapezoid with bases of 25.75 centimeters and 19 centimeters and a height of 5.5 centimeters
- a rectangle with a length of 5.5 centimeters and a width of 6 centimeters

As a product designer, you have to present your design and calculations to the executive board of the company you work for. The executive board will want to know all the details of the product packaging, design, and use of raw materials. Use the calculations and graph paper nets you've already designed to prepare for your presentation.

You may choose to:

1. Create a slideshow to present your work.

The executive board is very curious about what their product will look like in your design, so you should create a visually interesting slideshow to accompany your presentation. You should include your calculations and answers to the written questions as part of the presentation. The visuals in the slideshow should clearly present your design, along with any measurements, and raw materials information required in the questions at right. Present the slideshow to the class, electing a few classmates to serve as the executive board.

2. Build a 3-D model of your work.

After completing your calculations and designing your product on paper, build a scale model to bring to your presentation with the executive board. The board will want to be sure that all their requirements were met, so you will need to create a hand-out or flipchart poster along with the model. Your hand-out or poster should include measurements, design specifics, and information about raw materials as calculated in the questions to the right.

OR

3. Be creative!

Design your own way to present your product design to the executive board of the company that you are working with. As the product designer you are the expert and creative force behind the design. Remember, your presentation or project should include the calculations and answers to the questions and requirements posed by the company.

Transcontinental Toys
Additional Package Specifications

Transcontinental Toys has several requirements for this project. Design a container that can hold the required volume and can accommodate graphics that show the company logo, artwork, usage instructions, compatible equipment, and so forth.

The surface area of faces must be large enough to print the following shapes on the box.

- an isosceles triangle with a base of 4 inches and a height of 20 inches
- a right triangle with a base of 14 inches and a height of 4.25 inches
- an arrow with a length of 20.5 inches and a maximum width of 4.5 inches
- a square with 4-inch sides (There must be three of these squares placed side-by-side on one face of the rectangular prism.)
- a trapezoid with bases of 14.5 inches and 8.5 inches and a height of 20 inches
- a rectangle with a length of 14 inches and a width of 20 inches

As a product designer, you have to present your design and calculations to the executive board of the company you work for. The executive board will want to know all the details of the product packaging, design, and use of raw materials. Use the calculations and graph paper nets you've already designed to prepare for your presentation.

You may choose to:

1. Create a slideshow to present your work.

The executive board is very curious about what their product will look like in your design, so you should create a visually interesting slideshow to accompany your presentation. You should include your calculations and answers to the written questions as part of the presentation. The visuals in the slideshow should clearly present your design, along with any measurements, and raw materials information required in the questions at right. Present the slideshow to the class, electing a few classmates to serve as the executive board.

2. Build a 3-D model of your work.

After completing your calculations and designing your product on paper, build a scale model to bring to your presentation with the executive board. The board will want to be sure that all their requirements were met, so you will need to create a hand-out or flipchart poster along with the model. Your hand-out or poster should include measurements, design specifics, and information about raw materials as calculated in the questions to the right.

OR

3. Be creative!

Design your own way to present your product design to the executive board of the company that you are working with. As the product designer you are the expert and creative force behind the design. Remember, your presentation or project should include the calculations and answers to the questions and requirements posed by the company.