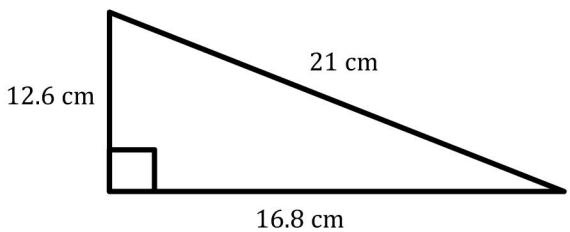
Name _____ Date _____

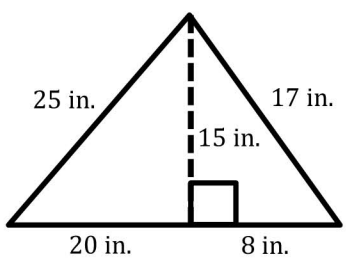
The Area of All Triangles Using Height and Base

Find the area of each triangle. Figures are not drawn to scale.

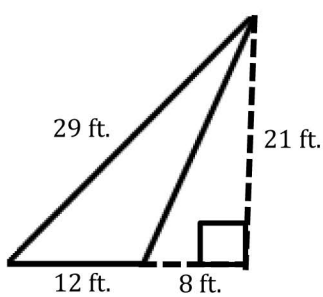
1.



2.

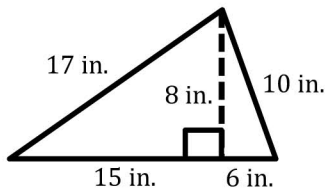


3.

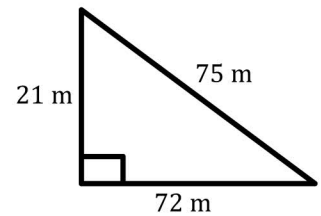


Calculate the area of each triangle below. Figures are not drawn to scale.

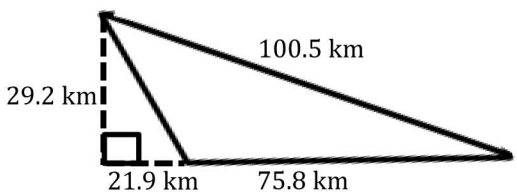
1.



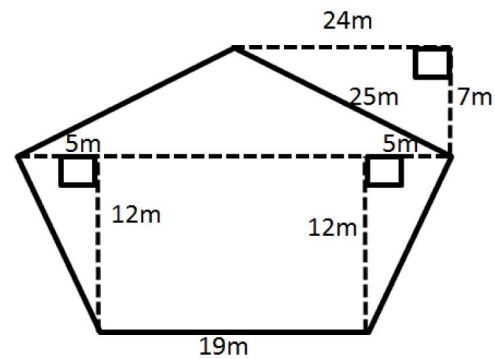
2.



3.

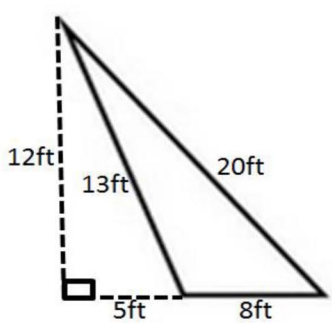


4.

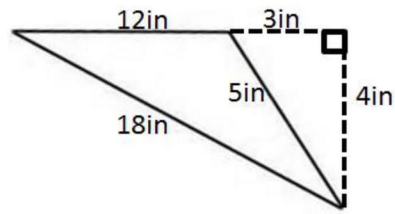


4. The Anderson's were going on a long sailing trip during the summer. However, one of the sails on their sailboat ripped, and they have to replace it. The sail is pictured below.

   If the sailboat sails on are sale for $2 per square foot, how much will the new sale cost?



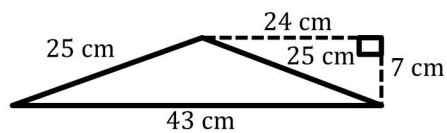
5. Darnell and Donovan are both trying to calculate the area of an obtuse triangle. Examine their calculations below.



Darnell's Work	Donovan's Work
$A = \frac{1}{2} \times 3 \text{ in.} \times 4 \text{ in.}$ $A = 6 \text{ in}^2$	$A = \frac{1}{2} \times 12 \text{ in.} \times 4 \text{ in.}$ $A = 24 \text{ in}^2$

Which student calculated the area correctly? Explain why the other student is not correct.

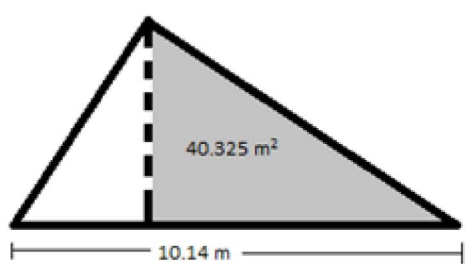
6. Russell calculated the area of the triangle below. His work is shown.



$$A = \frac{1}{2} \times 43 \text{ cm} \times 7 \text{ cm}$$
$$A = 150.5 \text{ cm}^2$$

Although Russell was told his work is correct, he had a hard time explaining why it is correct. Help Russell explain why his calculations are correct.

7. The larger triangle below has a base of 10.14 m; the gray triangle has an area of 40.325 m^2.

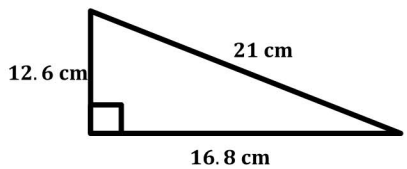


a. Determine the area of the larger triangle if it has a height of 12.2 m.

b. Let A be the area of the unshaded (white) triangle in square meters. Write and solve an equation to determine the value of A, using the areas of the larger triangle and the gray triangle.

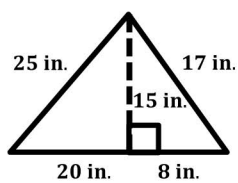
Find the area of each triangle. Figures are not drawn to scale.

1.



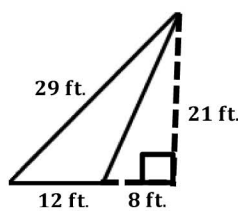
$A = \frac{1}{2}(12.6 \text{ cm})(16.8 \text{ cm}) = 105.84 \text{ cm}^2$

2.



$A = \frac{1}{2}(28 \text{ in.})(15 \text{ in.}) = 210 \text{ in}^2$

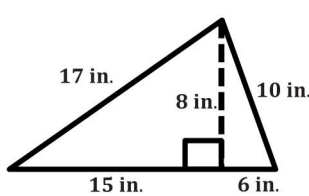
3.



$A = \frac{1}{2}(12 \text{ ft.})(21 \text{ ft.}) = 126 \text{ ft}^2$

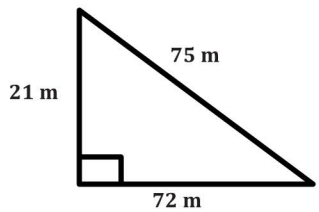
Calculate the area of each triangle below. Figures are not drawn to scale.

1.



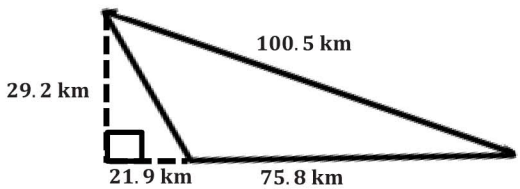
$A = \frac{1}{2}(21 \text{ in.})(8 \text{ in.}) = 84 \text{ in}^2$

2.



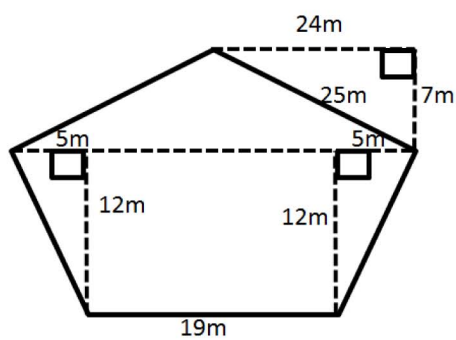
$$A = \frac{1}{2}(72\text{ m})(21\text{ m}) = 756\text{ m}^2$$

3.



$$A = \frac{1}{2}(75.8\text{ km})(29.2\text{ km}) = 1106.68\text{ km}^2$$

4.



$$A = \frac{1}{2}(5\text{ m})(12\text{ m}) = 30\text{ m}^2$$

$$A = \frac{1}{2}(7\text{ m})(29\text{ m}) = 101.5\text{ m}^2$$

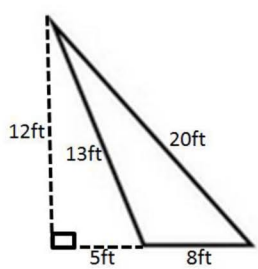
$$A = 12\text{ m}(19\text{ m}) = 228\text{ m}^2$$

$$A = 30\text{ m}^2 + 30\text{ m}^2 + 101.5\text{ m}^2 + 228\text{ m}^2$$

$$A = 389.5\text{ m}^2$$

5. **The Andersons are going on a long sailing trip during the summer. However, one of the sails on their sailboat ripped, and they have to replace it. The sail is pictured below.**

If the sailboat sails are on sale for $2 per square foot, how much will the new sail cost?



$$A = \frac{1}{2}bh$$

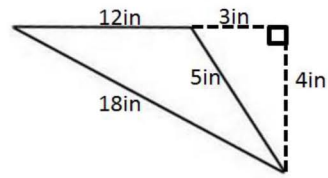
$$= \frac{1}{2}(8\text{ ft.})(12\text{ ft.})$$

$$= 48\text{ ft}^2$$

$$\frac{\$2}{\text{ft}^2} \times 48\text{ ft}^2 = \$96$$

The cost of the new sail is $96.

6. Darnell and Donovan are both trying to calculate the area of an obtuse triangle. Examine their calculations below.

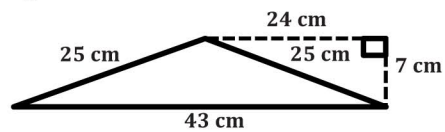


Darnell's Work	Donovan's Work
$A = \frac{1}{2} \times 3 \text{ in.} \times 4 \text{ in.}$ $A = 6 \text{ in}^2$	$A = \frac{1}{2} \times 12 \text{ in.} \times 4 \text{ in.}$ $A = 24 \text{ in}^2$

Which student calculated the area correctly? Explain why the other student is not correct.

Donovan calculated the area correctly. Although Darnell did use the altitude of the triangle, he used the length between the altitude and the base rather than the length of the actual base.

7. Russell calculated the area of the triangle below. His work is shown.

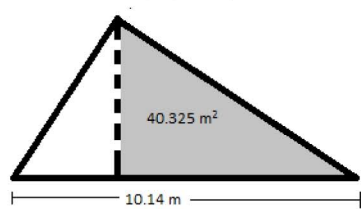


$$A = \frac{1}{2} \times 43 \text{ cm} \times 7 \text{ cm}$$
$$A = 150.5 \text{ cm}^2$$

Although Russell was told his work is correct, he had a hard time explaining why it is correct. Help Russell explain why his calculations are correct.

The formula for the area of the a triangle is $A = \frac{1}{2}bh$. Russell followed this formula because 7 cm is the height of the triangle, and 43 cm is the base of the triangle.

8. The larger triangle below has a base of 10.14 m; the gray triangle has an area of 40.325 m^2.



a. Determine the area of the larger triangle if it has a height of 12.2 m.

$$A = \frac{1}{2}(10.14 \text{ m})(12.2 \text{ m})$$
$$= 61.854 \text{ m}^2$$

b. Let A be the area of the unshaded (white) triangle in square meters. Write and solve an equation to determine the value of A, using the areas of the larger triangle and the gray triangle.

$$40.325 \text{ m}^2 + A = 61.854 \text{ m}^2$$
$$40.325 \text{ m}^2 + A - 40.325 \text{ m}^2 = 61.854 \text{ m}^2 - 40.325 \text{ m}^2$$
$$A = 21.529 \text{ m}^2$$