BECA / Dr. Huson / Geometry 02 Area and volume

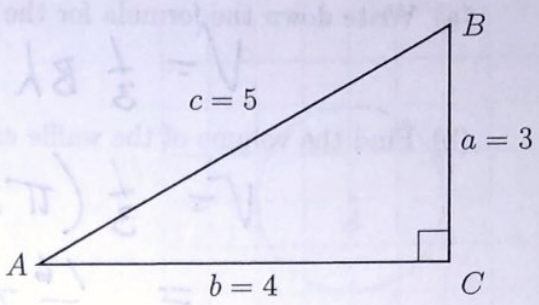
Name: Solutions

## 2.9 Test: Area, Perimeter, and Volume

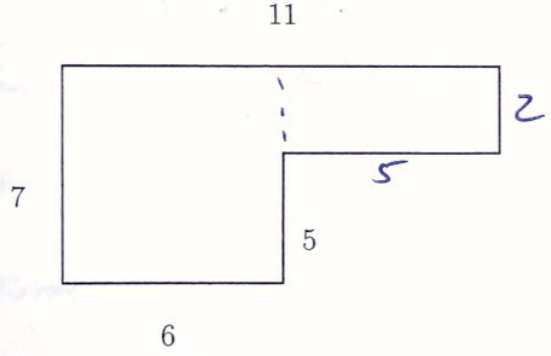
1. Find the area of $\triangle ABC$ shown below (not actual size) with $m\angle C = 90°$ and the lengths of the triangle's sides as $a = 3$, $b = 4$, and $c = 5$.

$A = \frac{1}{2}(4)(3)$

$= 6$




2. Find the area and perimeter of the shape shown below. Mark the missing side lengths first. All angles are 90°. *(not drawn to scale)*




$A_1 = 5 \times 2 = 10$

$A_2 = 6 \times 7 = 42$

$A_{TOTAL} = 10 + 42$

$= 52$

$P = 7 + 6 + 5 + 5 + 2 + 11$

$= 36$

3. Find the area $A$ and circumference $C$ of a circle with radius 5 feet (in terms of $\pi$).

$A = \pi 5^2$

$= 25\pi$

$C = 10\pi$

4. A waffle cone has a radius of 2 inches and height of 4 inches.

   (a) Write down the formula for the volume of a cone.

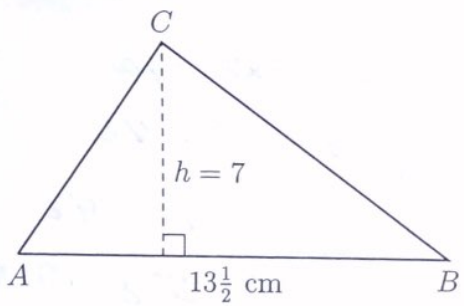
   $V = \frac{1}{3}Bh$

   (b) Find the volume of the waffle cone.

   $V = \frac{1}{3}(\pi r^2)4$

   $= \frac{16}{3}\pi$ $(\approx 16.75\text{-}51\ldots)$

5. Find the area of $\triangle ABC$. The altitude $h$ of the triangle is 7 centimeters and the base $AB = 13\frac{1}{2}$ cm. (diagram not to scale)




$A = \frac{1}{2}(13\frac{1}{2})(7)$

$= 47.\frac{1}{4}$

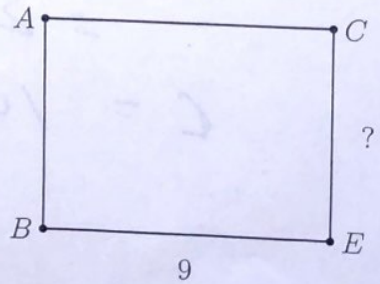
6. The rectangle $BECA$ has an area of 63, with length $BE = 9$.

   (a) Write an equation with the unknown $w$ as the width of the rectangle.

   $A = 9w = 63$

   (b) Solve.

   $w = 7$



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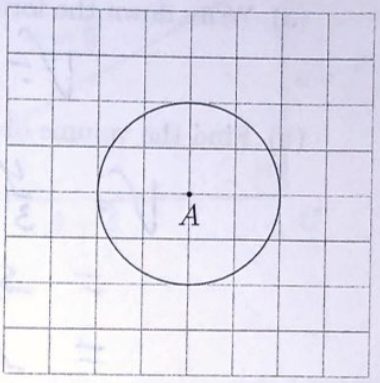
7. Given the circle centered at $A$ with radius $r = 2$. Leave an exact answer, in terms of $\pi$ if necessary.




(a) Find the circumference of circle $A$.

$C = 4\pi$

(b) Find the area of the circle.

$A = \pi 2^2 = 4\pi$

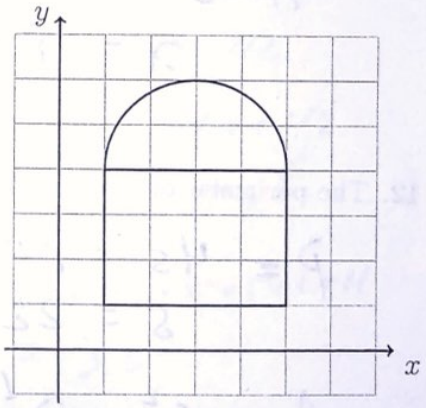
8. Find the area of the shape shown below composed of a rectangle and circular cap. Leave your answer as an exact value in terms of $\pi$.

$A_{S-C} = \frac{1}{2}\pi 2^2 = 2\pi$

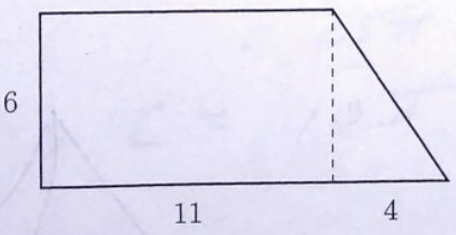
$A_R = 3 \times 4 = 12$

$A_{TOTAL} = 2\pi + 12$

$(\approx 18.28318\ldots)$




9. The compound shape shown below is composed of a rectangle 6 inches by 11 inches, and a triangle with base 4 inches. Find the total area of the combined shape.




$A_R = 6 \times 11 = 66$

$A_T = \frac{1}{2}(4)6$

$= 12$

$A_{TOTAL} = 66 + 12$

$= 78$

10. A given sphere has a radius of 6 inches.

(a) Write down the formula for the volume of a sphere.

$V = \frac{4}{3}\pi r^3$

(b) Find the volume of the sphere, to the *nearest whole cubic inch.*

$V = \frac{4}{3}\pi 6^3$

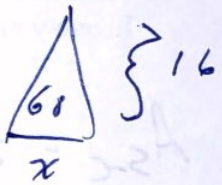
$= \frac{4}{3}\pi 216$ ~~$= 288\pi$~~ $\approx 904.7786\ldots \approx 905$

~~$= 16{,}738.4056\ldots \approx 16{,}738$~~

11. A triangle has an area of 68 square centimeters. Its height is 16 centimeters. Find the length of its base.

$A = \frac{1}{2}(16)x = 68$

$x = 8\frac{1}{2}$




12. The perimeter of a square is 10 inches. Find its area.

$P = 4s = 10$

$s = 2\frac{1}{2}$

$A = s^2 = (2\frac{1}{2})^2 = 6.25$

13. A pyramid with a square base has a volume of 576 cubic inches. Its height is the same as the lengths of the sides of the base. Find the area of its base.

$V = \frac{1}{3}x^2(x) = 576$

$x^3 = 1728$

$x = \sqrt[3]{1728}$

$= 12$