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Date: _____

PERIMETER COMMON CORE GEOMETRY

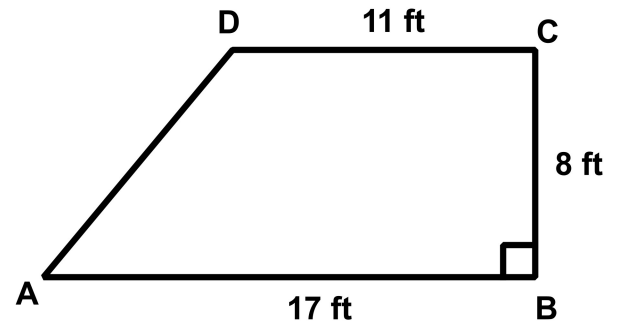


We start our unit on measurement and modeling by discussing the very simple idea of perimeter. Since grade school you've learned that perimeter represents the **distance or length** of the path that surrounds a two-dimensional shape. For many shapes this is straightforward. Sometimes it is not.

Exercise #1: An enclosure has the shape of a trapezoid with three known side lengths shown, in feet.

(a) Determine the length of side \overline{AD} .

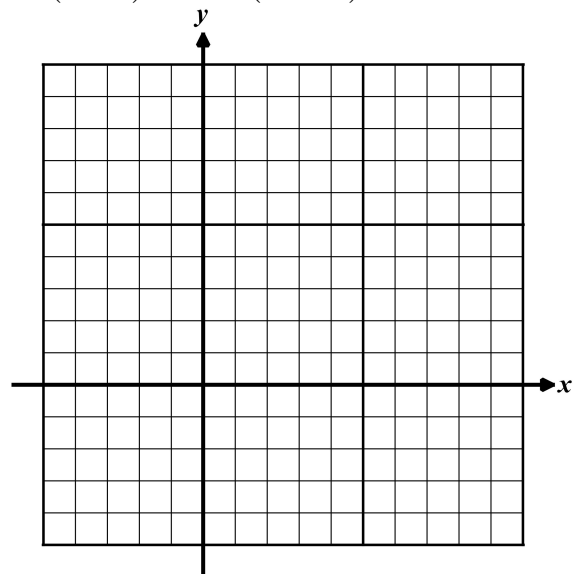
(b) Determine the perimeter of $ABCD$.



(c) If the enclosure is to be surrounded on all sides by fencing that costs \$0.75 per linear foot, then how much will it cost to enclose this trapezoid?

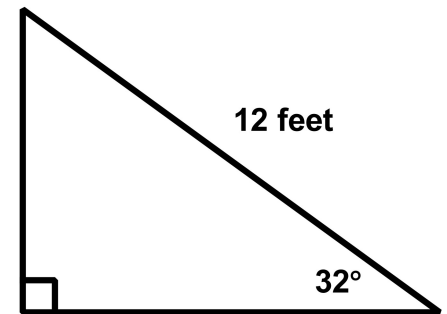
There are no fancy formulas for the perimeter of a figure whose boundary consists of straight line segments. We simply need to know the length of each one and then add these lengths together. Sometimes we might need to use other tools in math, such as the Pythagorean Theorem in Exercise #1, to aid in these lengths.

Exercise #2: Parallelogram $EFGH$ has vertices at $E(1, 7)$, $F(8, 7)$, $G(4, -3)$ and $H(-3, -3)$. Determine the perimeter of $EFGH$ to the nearest tenth.



Every time you calculate a perimeter use whatever tools you need to determine the lengths of all straight line segments, then simply add them together.

Exercise #3: A wooden frame is to be made using wood that costs \$1.25 per linear foot. The frame is in the shape of a right triangle whose hypotenuse is 12 feet and which contains an acute angle of 32° . Determine the overall cost of making this frame. Show the work involved.

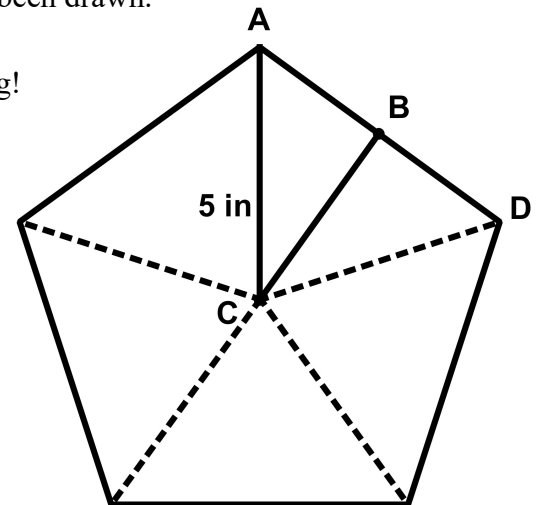


Trigonometry can be a powerful tool in determining perimeters because of its ability to calculate lengths in right triangles. This can be especially useful in calculating perimeters of **regular polygons**.

Exercise #4: A regular pentagon is drawn such that the distance from its center point to any one of its vertices is 5 inches as shown. Point B is at the midpoint of side \overline{AD} and \overline{CB} has been drawn.

(a) What is the measure of $\angle ACB$ in this diagram? Hint - don't use trig!

(b) Determine the length of side \overline{AB} . Leave your answer un-rounded.



(c) What is the perimeter of this pentagon to the nearest tenth of an inch?



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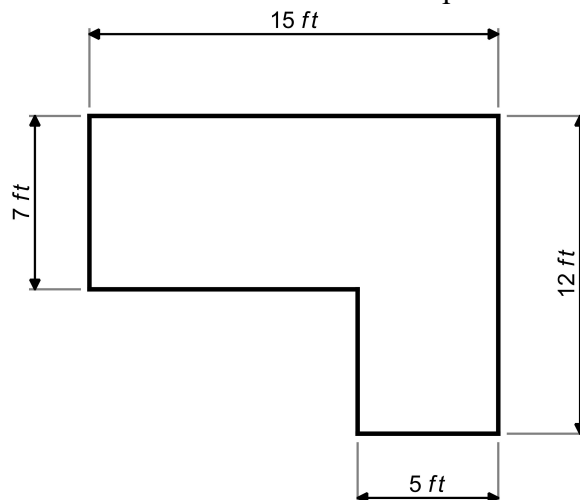
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PERIMETER

COMMON CORE GEOMETRY HOMEWORK

PROBLEM SOLVING

1. A chicken coop is being made in the shape shown below with the dimensions shown. If fencing must be placed on each side of the pen and it costs \$2.50 per foot, how much will it cost to enclose this pen? Show your work.



2. A right triangle has a hypotenuse that measures 22 inches and one leg that measures 9 inches. Which of the following is closest to the perimeter of this triangle in inches?

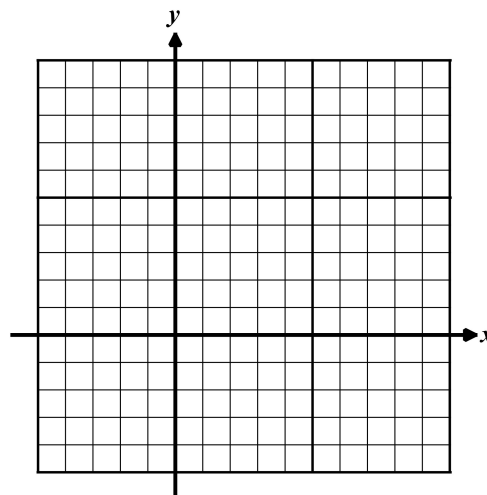
(1) 48.7

(3) 51.1

(2) 50.4

(4) 52.8

3. Triangle ABC has coordinates of $A(-4, -2)$, $B(4, 8)$, and $C(7, -2)$. Determine the perimeter of ABC to the nearest tenth. Show the work that leads to your answer.



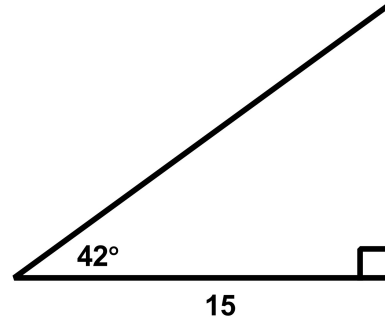
4. Given the right triangle shown below, which of the following expressions would correctly calculate its perimeter?

(1) $15 + 15 \sin 42^\circ + 15 \cos 42^\circ$

(2) $15 + \frac{15}{\sin 42^\circ} + \frac{15}{\cos 42^\circ}$

(3) $15 + 15 \tan 42^\circ + 15 \sin 42^\circ$

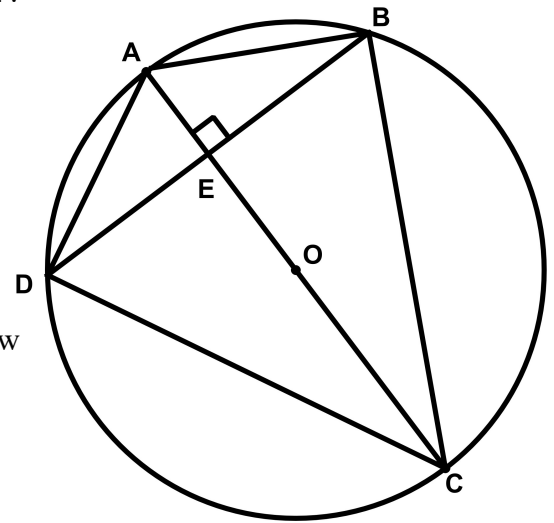
(4) $15 + 15 \tan 42^\circ + \frac{15}{\cos 42^\circ}$



5. Kite $ABCD$ is inscribed in circle O such that $BD = 12$ and $AE = 4$.

(a) Determine the length of \overline{CE} (see Unit #8.Lesson #4).

(b) Determine the perimeter of $ABCD$ to the nearest tenth. Show the work that leads to your answer.



6. Determine the perimeter of a regular octagon that has a distance from its center to any of its vertices of 10 inches. Round your answer to the nearest tenth of an inch.

