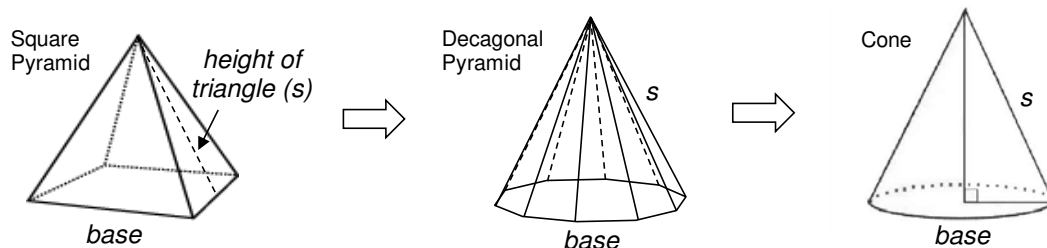# SURFACE AREA - CONES

ANSWERS

THE **SURFACE AREA** OF A CONE IS THE TOTAL AREA OF ITS SURFACE. THE PROCESS OF FINDING
THE SURFACE AREA OF A CONE IS SIMILAR TO FINDING THE SURFACE AREA OF A PYRAMID. THINK
OF A CONE AS A PYRAMID WITH LOTS OF SIDES CREATING LOTS OF TRIANGLES. SEE BELOW.

SURFACE AREA OF A SQUARE PYRAMID: AREA OF BASE $+ \frac{1}{2} \times$ (PERIMETER OF BASE x HEIGHT OF TRIANGLE)

SURFACE AREA OF A CONE: AREA OF BASE $+ \frac{1}{2} \times$ (CIRCUMFERENCE OF BASE x HEIGHT OF SLANT)
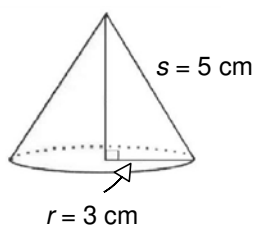
THE ONLY DIFFERENCE IS THE BASE OF EACH SOLID. ONE BASE IS A SQUARE AND
THE OTHER IS A CIRCLE. IF YOU FORGOT, PERIMETER AND CIRCUMFERENCE MEAN THE
SAME THING. THEY BOTH MEAN THE DISTANCE AROUND THE OUTSIDE OF A SHAPE.

YOU SHOULD KNOW HOW TO FIND THE AREA AND CIRCUMFERENCE (PERIMETER) OF A CIRCLE.

AREA OF A CIRCLE $= \pi r^2$

CIRCUMFERENCE OF A CIRCLE $= 2\pi r$

$\{$ WHERE " π " IS APPROXIMATELY 3.14 AND " r " IS THE
RADIUS OF THE CIRCLE OR HALF THE DIAMETER.

Helpful Example
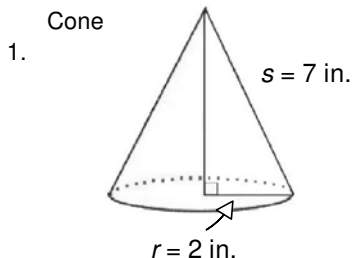
Find the surface area of the cone. Use 3.14 for π.

AREA OF BASE $+ \frac{1}{2} \times$ (CIRCUMFERENCE OF BASE x HEIGHT OF SLANT)

$\pi r^2 \quad + \quad \frac{1}{2} \times (\quad 2\pi r \quad \times \quad$ HEIGHT OF SLANT $\quad)$

$3.14 \times (3 \text{ cm})^2 + \frac{1}{2} \times (2 \times 3.14 \times 3 \text{ cm} \times 5 \text{ cm})$

$3.14 \times 9 \text{ cm}^2 + \frac{1}{2} \times 94.2 \text{ cm}^2$

$28.26 \text{ cm}^2 + 47.1 \text{ cm}^2$
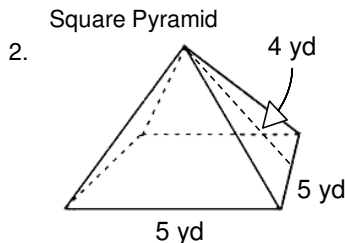
75.36 cm^2

DID YOU NOTICE!

YOU REALLY DO NOT HAVE TO MULTIPLY THE
TWO IN THE CIRCUMFERENCE SINCE YOU WILL
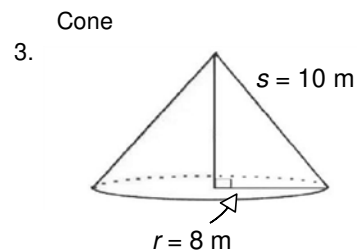EVENTUALLY DIVIDE IT BY TWO. IN OTHER
WORDS THEY CANCEL EACH OTHER OUT.

Now your turn. Find the surface area of each solid. For the cones use 3.14 for π.

1. Cone

$s = 7$ in.
$r = 2$ in.
56.52 square inches

2. Square Pyramid

4 yd
5 yd
5 yd
65 square yards

3. Cone

$s = 10$ m
$r = 8$ m
452.16 square meters

4. Find the surface area of a cone with a *diameter* of 12 feet and a *slant height* of 5 feet.

207.24 square feet