Welding
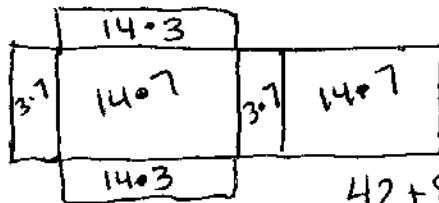**Surface Area Quiz**

Name _____Key_____

1. Find the surface area to the nearest square meter.

3 m   7 m   14 m
Not drawn to scale
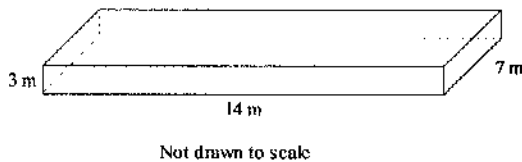
$3 \cdot 7 = 21 * 2 = 42$
$14 \cdot 3 = 42 * 2 = 84$
$14 \cdot 7 = 98 * 2 = 196$

$42 + 84 + 196 = \boxed{322 \text{ m}^2}$
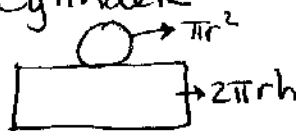
2. Find the surface area to the nearest square meter.

10 m   6 m   8 m   17 m
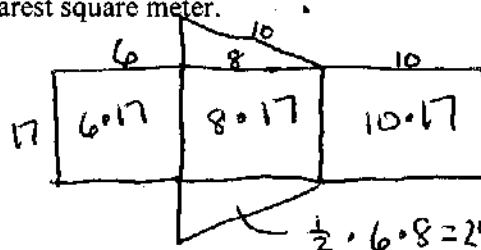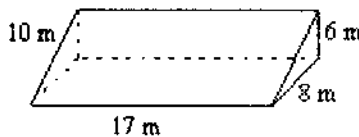
$6 \cdot 17 = 102$
$8 \cdot 17 = 136$
$10 \cdot 17 = 170$
$\frac{1}{2} \cdot 6 \cdot 8 = 24 * 2\triangle = 48$
$\frac{1}{2} \cdot 6 \cdot 8 = 24$

$102 + 136 + 170 + 48 = \boxed{456 \text{ m}^2}$

3. A metalworker welded a cylinder to a rectangular prism as shown in the figure. The cylinder has a height of 5 centimeters and radius 3 centimeters. Find the surface area of the finished product?
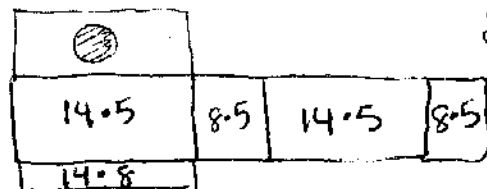

3cm   5cm   5 cm   8 cm   14 cm
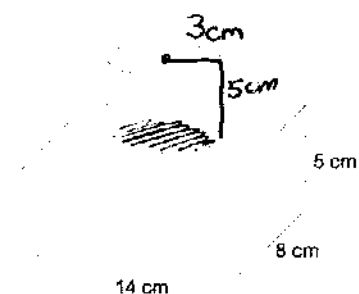
Cylinder
$\to \pi r^2$
$+ 2\pi r h$

$SA = 2\pi(3)(5) + \pi(3)^2$
$= 30\pi + 9\pi$
$= 39\pi$
$SA = 122.5 \text{ cm}^2$

Prism
$5(8) = 40 * 2 = 80$
$14(5) = 70 * 2 = 140$
$14(8) = 112$
$14(8) - \pi 3^2 = 83.7$
$SA = 80 + 140 + 112 + 83.7$
$SA = 415.7 \text{ cm}^2$

Total $SA = 122.5 + 415.7 = \boxed{538.2 \text{ cm}^2}$

4. Find the surface area of the figure to the nearest whole number.

Not part of surface
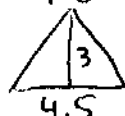
2.5 ft   3 ft   6 ft   4.5 ft   4.5 ft
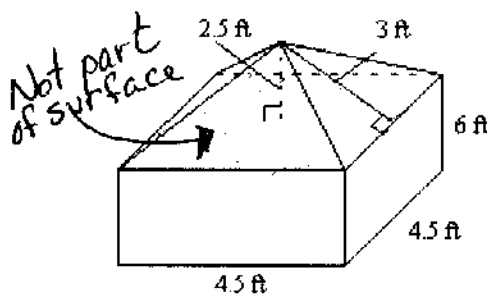
Prism (no top)
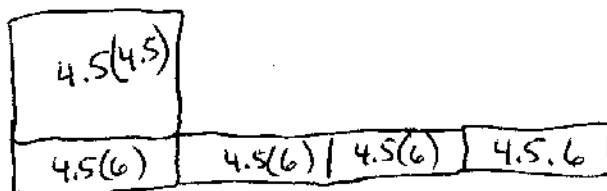$4.5(6) = 27 * 4 = 108$
$4.5(4.5) = 20.25$

Pyramid (no base)
$\frac{1}{2}(4.5)(3) = 6.75 * 4\triangle = 27$

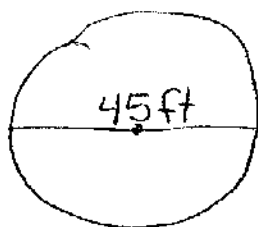$SA = 108 + 20.25 + 27$
$SA = 155.25$
$SA = \boxed{155 \text{ ft}^2}$

5. An architect is designing a half-spherical dome above a circular fountain and path. The architect wants the dome to be only over the fountain and path. The total diameter of the fountain with surrounding path is 45 feet.
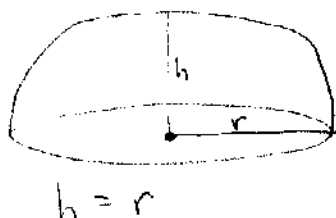a. What is the height of the cover? Explain.
b. What is the surface area of the cover? Show your work.

A) $45 \div 2 = 22.5 ft$
Height of cover is radius of dome ($\frac{1}{2}$ sphere)

B) $SA = 4\pi r^2$ ← sphere
$SA = 4\pi (22.5)^2$
$SA \quad 6361.7$ SA of dome is
$\quad \div 2$ ← only $\frac{1}{2}$ sphere
$$SA = 3180.9 ft^2$$

6. If a gallon of paint covers 350 ft², how many cans of paint will be needed to paint two coats on the walls of a 12' x 18' room with a ceiling height of 8 feet?

$12 \cdot 8 = 96$ * 2 walls = 192
$18 \cdot 8 = 144$ * 2 walls = 288

$SA = 480 ft^2$ * 2 coats paint
$\quad 960 ft^2$ coverage needed

$960 \div 350 = 2.7$

$$\boxed{3 \text{ cans paint needed}}$$