Name: _____ **Date:** _____ **HW #54 Surface Area**

Find the surface area of each shape below (be careful…you may not just be doing a straight forward formula!) Give both exact and approximate answers unless otherwise indicated.

1. What is the surface area of half a watermelon that has a radius of 8 inches?

When it was cut in half a circle was created at the top

½ a sphere

$SA_{SP} = \frac{4\pi r^2}{2} + \pi r^2$

$= 2\pi r^2 + 1\pi r^2$

$= 3\pi r^2$

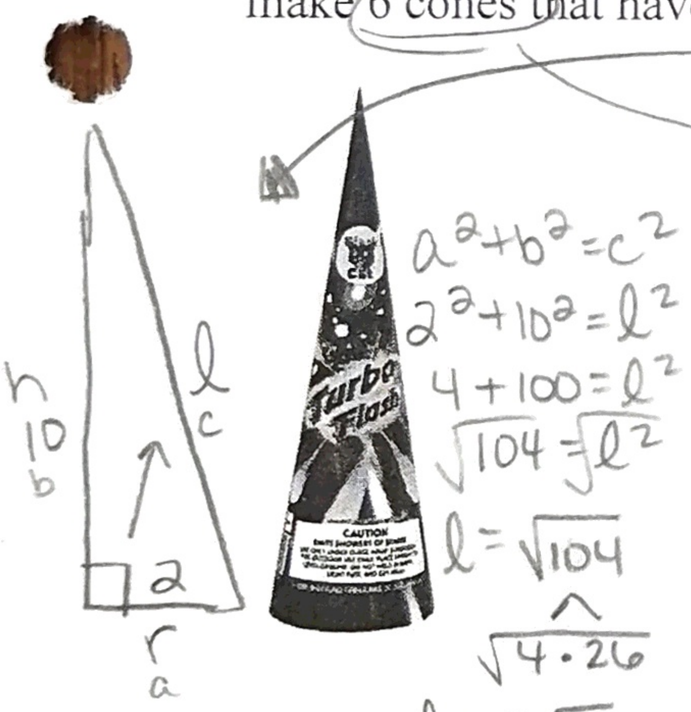
$= 3\pi(8)^2$

$= 3 \cdot 64 \cdot \pi$

$= 192\pi \text{ in}^2$ or $\approx 603.19 \text{ in}^2$

$r = 8$

2. **Cone** fireworks are made of cardboard and have an empty bottom. How much cardboard is needed to make 6 cones that have a height of 10 inches and a radius of 2 inches.



So no circle on the bottom

$SA_{cone} = (\pi r l + \pi r^2)$ ← 6

$a^2 + b^2 = c^2$

$2^2 + 10^2 = l^2$

$4 + 100 = l^2$

$\sqrt{104} = \sqrt{l^2}$

$l = \sqrt{104}$

$\sqrt{4 \cdot 26}$

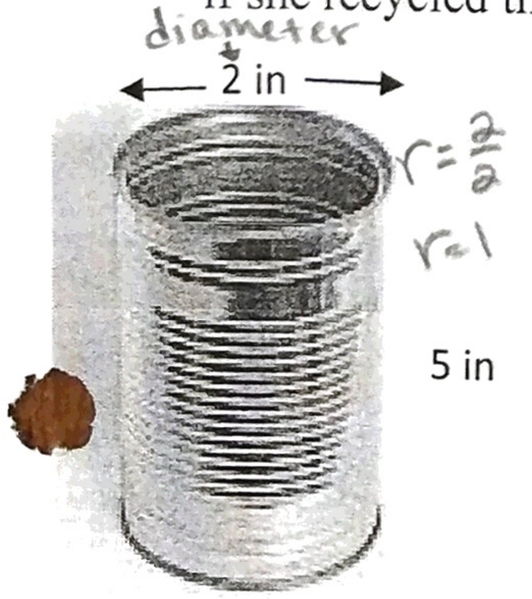
$l = 2\sqrt{26}$

$= 6\pi(2)(2\sqrt{26})$

$= 6 \cdot 2 \cdot 2 \cdot \pi \cdot \sqrt{26}$

$= 24\pi\sqrt{26} \text{ in}^2$ or $\approx 384.46 \text{ in}^2$

3. Missy's town recycles steel cans and pays \$0.05 for every square inch of steel. Missy has 24 cans like the one below (she's cut off and thrown away the lid). **Approximately** how much money could she get if she recycled them?



So only 1 circle

$r = \frac{2}{2}$

$r = 1$

$SA_{cyl} = (2\pi r^2 + 2\pi r h) \cdot 24$

$= [\pi(1)^2 + 2\pi(1)(5)] \cdot 24$

$= (1\pi + 10\pi) \cdot 24$

$= 11\pi \cdot 24$

$= 264\pi \text{ in}^2$

Final Ans.

She gets 5¢ for each one

So $264\pi \cdot 0.05$ $\approx \$41.47$