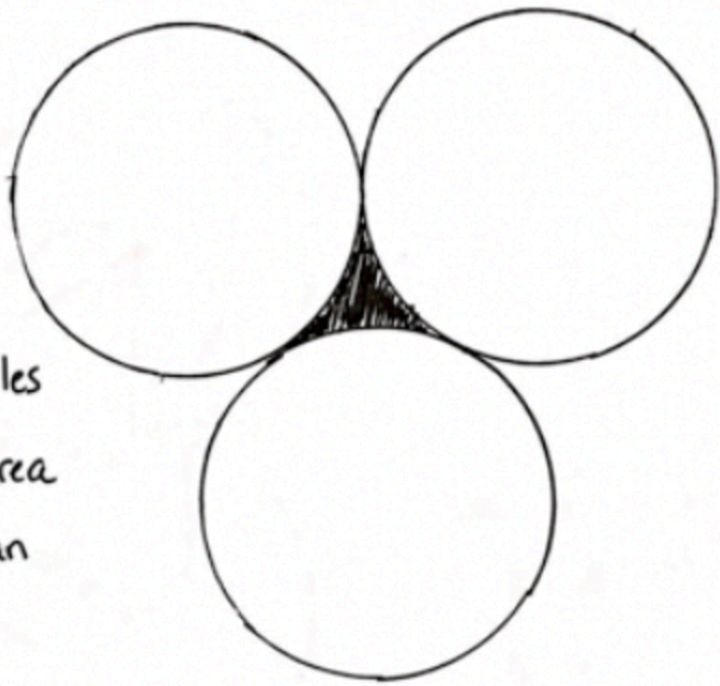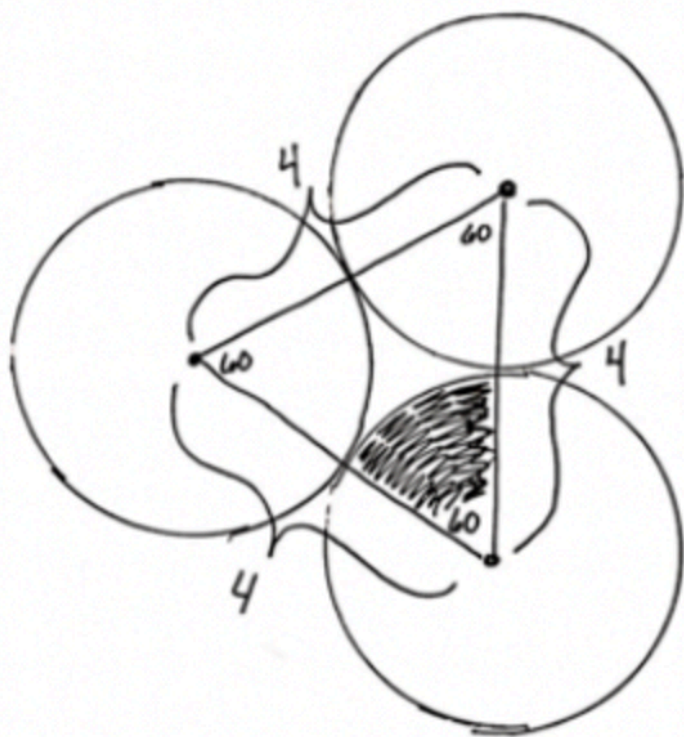# Student #1

Area of Circles:

$$A = \pi r^2$$
$$A = \pi (2)^2$$
$$A = 4\pi \times 3 \text{ circles}$$
$$A = 12\pi; \text{ the area}$$

has to be more than 12π.

Student #2

3 circles w/
A = 4π

A = 12π - 2π

10π

↑ has to be
greater than this

Area of circle:
$$A = \pi r^2$$
$$A = 4\pi$$

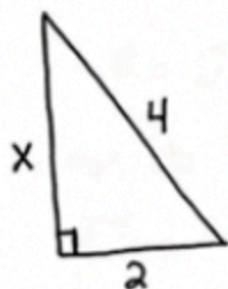Area of shaded
region:
$$A = \frac{4\pi}{6} = \frac{2\pi}{3}$$
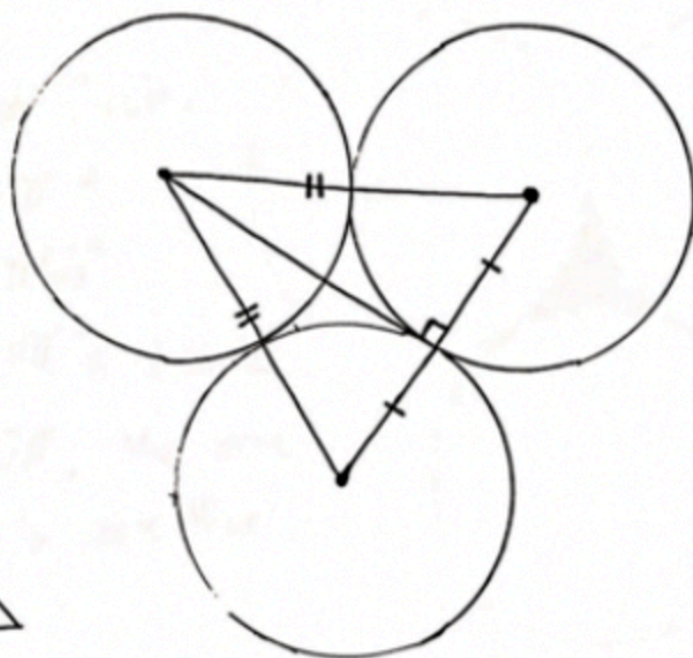
× 3

$$\frac{2\pi}{3} \cdot 3 = 2\pi$$

Student #3

$4^2 = 2^2 + x^2$

$16 = 4 + x^2$

$12 = x^2$

$\sqrt{12} = x$

$2\sqrt{3} = x$

Area of $\triangle$:

$A = 4 \cdot 2\sqrt{3} \cdot \frac{1}{2}$

$A = 4\sqrt{3}$
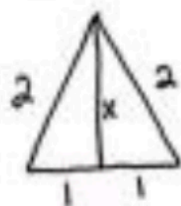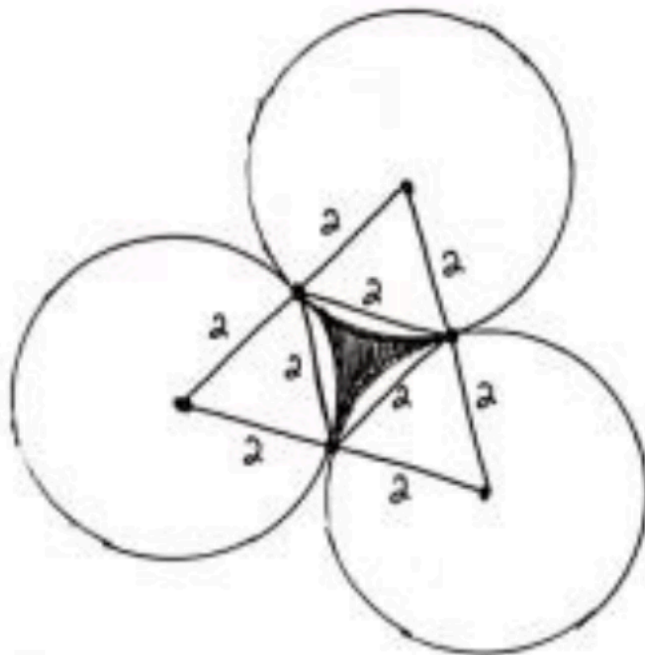
Area of 3 circles:

$A = \pi \cdot r^2 \cdot 3$

$A = \pi \cdot 4 \cdot 3$

$A = 12\pi$

Total:

$12\pi + 4\sqrt{3}$

Student #4

2   2

1   1

$4 = 1 + x^2$
$3 = x^2$
$\sqrt{3} = x$

$A = \frac{1}{2} \cdot 2 \cdot \sqrt{3}$
$A = \sqrt{3} \times 3$

$3\sqrt{3}$