

Name: _____

Find the semimajor axis of the following planets:
Caprica is orbiting an object that is 5 Solar Masses and its orbital period is 4 Earth Years.

$$\frac{a^3}{(4 \text{ Earth Years})^2} = 5$$

$$a^3 = 5 * 16$$

$$a^3 = 80$$

$$(a^3)^{\frac{1}{3}} = (80)^{\frac{1}{3}}$$

$$a = 4.3 \text{ AU}$$

Solaris is orbiting an object that is 0.5 Solar Masses and its orbital period is 0.75 Earth Years.

$$\frac{a^3}{(0.75 \text{ Earth Years})^2} = 0.5$$

$$a^3 = 0.5625 * 0.5$$

$$a^3 = 0.28125$$

$$(a^3)^{\frac{1}{3}} = (0.28125)^{\frac{1}{3}}$$

$$a = 0.66 \text{ AU}$$

Mandalore is orbiting an object that is 3.5 Solar Masses and its orbital period is 4.6 Earth Years.

$$\frac{a^3}{(4.6 \text{ Earth Years})^2} = 3.5$$

$$a^3 = 21.16 * 3.5$$

$$a^3 = 74.06$$

$$(a^3)^{\frac{1}{3}} = (74.06)^{\frac{1}{3}}$$

$$a = 4.2 \text{ AU}$$