# Working with Exponents

**Star Trek**

Name_____

In episode 20, “Court Martial”, of the original Star Trek television series, Captain Kirk is charged with killing a crew member. To prove the crew member is still alive and hiding on the ship, the heartbeats of everyone on board are amplified and then the sounds of the heartbeats of all the known passengers are eliminated, leaving only the heartbeat of the hiding crew member to be heard.

In explaining how the heartbeats could be heard, Captain Kirk states that the ship’s computer is amplifying the heartbeats by a factor of "one to the fourth power"!

**Explain why this statement is considered a memorable quote.**

***Directions: For the following problems, if necessary, round answers to two decimal places.***

1. $2^3$ = _____

2. $(-2)^3$ = _____

3. $2^{-3}$ = _____

4. $2.5^3$ = _____

**5.** $51.7^2$ = _____

**6.** $12.6^{-2}$ = _____

**7.** $1^4$ = _____

**8.** $1^{10}$ = _____

**9.** $1^{-5}$ = _____

**10.** $0^5$ = _____

**11.** $0^{-3}$ = _____

**12.** $a^m \cdot a^n$ = _____

**13.** $p^{-4}$ = _____

**14.** $3^4 \times 4^2$ = _____

**15.** $10.2^5 \times 6.34^3$ = _____

**16.** $x^6 \cdot x^5$ = _____

**17.** $a^7 \cdot a^{-3}$ = _____

**18.** $g^{-6} \cdot g^{-2}$ = _____

**19.** $x^5 \cdot x^3 \cdot x$ = _____

**20.** $b^6 \cdot b^2 \cdot b^{-2}$ = _____

**21.** $\left(a^m\right)^n$ = _____

**22.** $\left(x^5\right)^3$ = _____

**23.** $\left(g^4\right)^2 \cdot g^3$ = _____

**24.** $a \cdot \left(a^{-1}\right)^3 \cdot a^2$ = _____

***Express the remaining answers in fraction form.***

**25.** $\left(\frac{1}{4}\right)^3$ = _____

**26.** $\left(\frac{2}{5}\right)^{-2}$ = _____

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