

Instructions: Show all work. Give exact answers (improper fractions) and do not round unless specifically asked to do so. If you work the problem in your calculator you can write keystrokes to show work for partial credit.

1. If a is an integer and $a \neq 0$, which expressions are always positive, and which always negative? (It's possible neither is a response.)

a. a^3

c. a^4

e. $(-a)^3$

b. $(-a)^4$

d. $-(a)^3$

f. $-(a)^4$

2. Simplify $\left(\frac{3 \cdot (-2)^2 + 5}{7^2 - 8 \div (-4)}\right)^2$

3. Simplify the following expression as much as possible. $\left(\frac{4^2 - 2(-13)(1)}{7 \cdot 3}\right)^2$