

Pre-Calculus
Compositions of Real World Functions

Name Answer Key
Hour

1. Laura sends an average of 27 text messages per month to each of f friends. Her cell phone provider charges her a flat rate of \$3.50 per month and \$0.04 per text message. The function $t(f)$ gives the total number of text messages Laura sends each month to f friends, and $g(t)$ gives the amount Laura is charged by her cell phone provider for t text messages.

- a. Write an equation for $t(f)$ and $g(t)$.

$$t(f) = 27f \quad g(t) = .04t + 3.50$$

- b. Find $g(t(f))$.

$$g(t(f)) = .04(27f) + 3.50$$

- c. What does $g(t(16)) > 20.36$ mean in the context of this problem?

$$.04(27(16)) + 3.50 = 20.78$$

her charge for sending messages to 16 friends is

2. A discount function $D(x)$ that take 10% off an entire purchase can be given by $D(x) = 0.90x$ where x is the amount of the entire purchase. A tax function $T(x)$ that adds a tax of 10% to an entire purchase can be given by $T(x) = 1.10x$.

- a. Explain why the function $D(x) = 0.90x$ models a situation where an item is 10% off the original price, x , and why the function $T(x) = 1.10x$ models a situation where an item is increasing in price by 10%.

- b. Find $D(T(x))$ and $T(D(x))$. Explain what $D(T(x))$ and $T(D(x))$ represent.

- c. Compare the 2 compositions. Which one is a better deal?