

5. [6 points] For fun, Booboo the chimpanzee likes to climb up a pole in the Ape House at the Go Blue Zoo and drop his doll Deedee. The function $T(h)$ gives the number of seconds it takes for Deedee to hit the ground when Booboo drops her from h feet above ground level. Write an expression for each of the following new functions, in terms of the function T :
- a. [2 points] $R(h)$ is the time it takes, *in minutes*, for Deedee to hit the ground when dropped from h feet above ground level. (Note that 1 minute is equivalent to 60 seconds.)

$$R(h) = \frac{T(h)/60}{1}$$

Solution: We need to take our output, which is in seconds, and convert it to minutes by dividing by 60.

- b. [2 points] $F(y)$ is the time it takes, in seconds, for Deedee to hit the ground when dropped from y yards above ground level. (Note that 1 yard is equivalent to 3 feet.)

$$F(y) = \frac{T(3y)}{1}$$

Solution: We need to take our new input units, which are yards, and convert them back to feet by multiplying by 3 before inputting into T .

- c. [2 points] There is a small platform mounted on the pole 8 feet up from the ground. Sometimes Deedee lands there instead of the ground. The function $P(h)$ gives the time, in seconds, for Deedee to hit the platform when dropped from h feet above ground level. If we want to express $P(h)$ in terms of the function T , circle the best option below.

$P(h) = T(h + 8)$

$P(h) = T(h - 8)$

$P(h) = T(h) + 8$

$P(h) = T(h) - 8$

Solution: The platform 8 feet up is decreasing the total height the doll falls by 8 feet; so it's as if Booboo dropped the doll from 8 feet lower to being with.