Quiz 1. *True/False*: The function $f(x) = 9 - 5x$ is a linear function with slope 5 and y-intercept 9.

Solution. The statement is *false*. We know a function of the form $f(x) = mx + b$ is a linear function with slope m and y-intercept b. Because we have $f(x) = 9 - 5x = -5x + 9$, we have $m = -5$, i.e. slope -5, and y-intercept 9, i.e. $(0, 9)$. But then the slope is -5, not the given value of 5.

Quiz 2. *True/False*: If $f(x) = 2x - 1$ and $g(x) = 3 - x$, then $(f \circ g)(0) = f(0)g(0) = -1 \cdot 3 = -3$.

Solution. The statement is *false*. First, note that $f(0) = 2(0) - 1 = -1$, $g(0) = 3 - 0 = 3$, and $f(3) = 2(3) - 1 = 6 - 1 = 5$. What was given was function multiplication, i.e. what was computed was $(fg)(0) = f(0)g(0) = -1 \cdot 3 = -3$. What was originally written was function composition. We have $(f \circ g)(0) = f(g(0)) = f(3) = 5$.

Quiz 3. *True/False*: Compared to the graph of $f(x)$, the graph of $5 - 3f(x + 2)$ is stretched by a factor of 3, then shifted to the right by 2 and up by 5.

Solution. The statement is *false*. We know that $f(x + 2)$ is the graph of $f(x)$ shifted 2 to the *left*. The graph of $-3f(x + 2)$ is then the graph of $f(x)$ shifted two to the left, stretched by a factor of 3, and reflected across the x-axis. Finally, the graph of $5 - 3f(x + 2)$ is the graph of $f(x)$ shifted two to the left, stretched by a factor of 3, reflected across the x-axis, then shifted upwards by 5.

Quiz 4. *True/False*: The function $f(x) = 4(5^{-x})$ is a concave up, decreasing, exponential function.

Solution. The statement is *true*. A function of the form $f(x) = Ab^x$ is an exponential function. We can summarize whether $f(x)$ is increasing or decreasing and concave up or down as follows: But

	$0 < b < 1$	$b > 1$
$A > 0$	Decreasing, Concave Up	Increasing, Concave Up
$A < 0$	Increasing, Concave Down	Decreasing, Concave Down

we have $f(x) = 4(5^{-x}) = 4(5^{-1})^x = 4\left(\dfrac{1}{5}\right)^x$. Therefore, $f(x)$ is exponential with $A = 4 > 0$ and $0 < b = \frac{1}{5} < 1$. Therefore, $f(x)$ is a decreasing, concave up, exponential function.

Quiz 5. *True/False*: The function $f(x) = 5(2^{1-2x})$ is equal to the function $g(x) = 10\left(\dfrac{1}{4}\right)^x$.

Solution. The statement is *true*. Observe that we have...

$$f(x) = 5(2^{1-2x}) = 5 \cdot 2^1 \cdot 2^{-2x} = 10 \cdot 2^{-2x} = 10(2^{-2})^x = 10\left(\frac{1}{2^2}\right)^x = 10\left(\frac{1}{4}\right)^x = g(x)$$