Quiz 1. *True/False*: A real number is 'any' number expressible as a decimal.

Solution. The statement is *true*. A real number is 'any' number that can be expressed as a decimal—even if it is not immediately given as such, e.g. $1 = 1.0$, $-5 = -5.0$, $\frac{1}{2} = 0.5$, $\sqrt{2} \approx 1.41421\ldots$, $\pi \approx 3.14159\ldots$, etc.

Quiz 2. *True/False*: $\gcd(2^3 \cdot 3^1, 2 \cdot 3^2 \cdot 5^2) = 2^3 \cdot 3^2 \cdot 5^2$ and $\operatorname{lcm}(2^3 \cdot 3^1, 2 \cdot 3^2 \cdot 5^2) = 2 \cdot 3$.

Solution. The statement is *false*. It is 'obvious' that these cannot be correct because the gcd is greater than the given integers and the lcm is smaller than the given integers—both of which is impossible as we know that $\gcd(a, b) \leq \min\{a, b\}$ and $\operatorname{lcm}(a, b) \geq \max\{a, b\}$. Remember given a prime factorization of the numbers, we find the gcd by choosing the *smallest* powers of each prime that appears in *both* of the factorizations. We find the lcm by choosing the *largest* powers of each prime that appears in the factorizations. Here, the gcd and lcm were computed reversing these rules. We should have $\gcd(2^3 \cdot 3^1, 2 \cdot 3^2 \cdot 5^2) = 2 \cdot 3$ and $\operatorname{lcm}(2^3 \cdot 3^1, 2 \cdot 3^2 \cdot 5^2) = 2^3 \cdot 3^2 \cdot 5^2$.

Quiz 3. *True/False*: $\frac{7}{5}$ divided by $\frac{21}{10}$ is $\frac{2}{3}$.

Solution. The statement is *true*.
The statement is *true*. Note that division by a nonzero number is the same as multiplying by its reciprocal. So we have

$$\frac{\frac{3}{10}}{\frac{12}{5}} = \frac{3}{10} \cdot \frac{5}{12} = \frac{\cancel{3}^{1}}{\cancel{10}^{2}} \cdot \frac{\cancel{5}^{1}}{\cancel{12}^{4}} = \frac{1}{8}$$

One can also rewrite the problem as...

$$\frac{\frac{3}{10}}{\frac{12}{5}} = \frac{3}{10} \div \frac{12}{5}$$

But then to divide, we multiply by the reciprocal and proceed as in the solution above.

Quiz 4. *True/False*: $\left(\frac{x^8}{y^3}\right)^{-1/2} = \frac{\sqrt{y^3}}{x^4}$

Solution. The statement is *true*.
Quiz 5. *True/False*: The decimal number 14.7 in scientific notation is $1.47 \cdot 10^{-1}$.

Solution. The statement is *true*.
Quiz 6. *True/False*: To increase 45.6 by 162%, you compute $45.6(1.62)$.

Solution. The statement is *true*.
The statement is *false*. To find 119% of 68, we would multiply 68 by the percent written as a decimal. This would be $68(1.19)$. However, to increase or decrease a number by a percentage, we

compute the number $\#(1 \pm \%)$, where we add if we are increasing, subtract if we are decreasing, $\#$ is the number, and % is the percentage written as a decimal. So to increase 68 by 119%, we need to compute $68(1 + 1.19) = 68(2.19)$.