

Correction of Quiz 1

Some general remarks.

First, take some time to read the problem carefully. You had plenty of time to do this quiz, so it didn't hurt to read the problem twice, and to be sure you have understood what is asked. For instance, in question 3, some students computed the price of the computer after a 10% decrease in its value (and not after *three* 10%-decreases). Those mistakes are easy to avoid! Also, be sure that the more information you write on your answer sheet, the more points I can grant you when your answer is wrong: it is by reading your notes that I can understand your work, and if your mistake was maybe a small one. Thus you should keep your notes organised: in this way, I can understand them and see where your mistake was. But what's more important, if you keep your notes organised, you will know better what you are currently doing and won't get lost in the middle of a computation. For instance, in question 3, you could write which figure corresponds to which month (like in the array I made) to keep track of the number of months. This would have prevented the mistake of computing the price after *two* months (and not three) as it happened to several students. Similarly, in exercise 5, if you write something like *perimeter of one semi-circle* = 12.56ft (instead of just 12.56), you easily see what you are computing, and easily avoid some errors. Moreover, it makes it much easier for you to doublecheck your work!

Correction of the quiz.

1. (2 pts) Express *three sevenths* as a fraction, a decimal (stop at 3 digits), and as a percentage.

Answers: *Fraction:* $\boxed{2/7}$

Decimal: $\boxed{0.429}$ $2 \div 7 = 0.429$.

Percentage: $\boxed{42.9\%}$ $0.429 \times 100 = 42.9$

2. (2 pts) The ratio of cellular phones to standard phones sold by a company is 3:7. What percentage of cellular phones do they sell?

Answer: $\boxed{30\%}$ For 3 cellular phones sold, 7 standard phones are sold. So for 3 cellular phones sold, $3+7=10$ phones (standard and cellular) are sold. Therefore, the percentage of cellular phones sold is $\frac{3}{10} \times 100 = 30\%$.

Note that the percentage is computed over the *total* number of (standard and cellular) phones so the percentage is *not* $\frac{3}{7} \times 100$ (which would be 42.9%).

3. (2 pts) Suppose that 3 months ago, the price of a computer was \$2,000. Each month, its price dropped by 10%. How much is that computer now?

Answer: $\boxed{\$1,458}$

Initial value	\$2,000
After one month	$\$2,000 - \frac{10}{100} \times \$2,000 = \$1,800$
After two months	$\$1,800 - \frac{10}{100} \times \$1,800 = \$1,620$
After three months	$\$1,620 - \frac{10}{100} \times \$1,620 = \$1,458$

Note that removing 10% three times to a value is *not* the same as removing 30% from this value (since it would give a result of $\$2,000 - 30\% \times \$2,000 = \$1,400$).

4. (2 pts) Evaluate the following expressions (you may use your calculator, and you may give the result either as a decimal or as a fraction):

$$\frac{2}{7} \div \frac{2}{3} - \frac{1}{2} = \frac{2}{7} \times \frac{3}{2} - \frac{1}{2} = \frac{6}{14} - \frac{1}{2} = \frac{6}{14} - \frac{7}{14} = \boxed{\frac{-1}{14} = -.0714.}$$

$2a - 5b^3$ for $a = 7$ and $b = -4$

$$2a - 5b^3 = 2 \times 7 - 5 \times ((-4)^3) = 14 - 5 \times (-64) = 14 + 5 \times 64 = 14 + 320 = \boxed{334}$$

Note that $14 - 5 \times (-64) = 14 + 5 \times 64$.

5. (2 pts) The garden shown below is in the form of a square of side 8 feet with four semi-circles attached as shown. Find the perimeter and the area of the garden. Be sure to include the units used.

Perimeter: The perimeter of a figure is the length of its outside border. Here it is composed of 4 semicircles with radius 4ft. The perimeter of a full circle with radius r is $2\pi r$, so the perimeter of one semicircle with 4ft-radius is $\frac{1}{2} \times 2\pi \times 4\text{ft} = 12.56\text{ft}$. Therefore the perimeter of the garden is $4 \times 12.56\text{ft} = \boxed{50.3\text{ft}}$.

Note that you don't have to include the perimeter of the square in this computation since the square is not part of the outside border of the garden.

Area: The garden can be cut into a 8ft \times 8ft square and 4 semicircles with radius 4ft. The area of the square is 8ft \times 8ft = 64ft^2 . The area of a (full) circle of radius r is πr^2 , so the area of a semicircle of radius 4ft is $\frac{1}{2} \times \pi \times (4\text{ft})^2 = 25.13\text{ft}^2$. Thus, the area of the garden is $64\text{ft}^2 + 4 \times 25.13\text{ft}^2 = \boxed{164.5\text{ft}^2}$

Note that the perimeter is in feet which is indeed an unit for a *length* and that the units of the area are square feet which is an unit for an *area* (finding an area in feet (and not square feet) is as strange as finding it in kilograms!).

