1. **(FIFA3) Annotate the problem below and show your work on the right. Then answer the question below.**

Bryan has a prepaid cell phone with a balance of $75. He is charged the same rate per minute.

- After 1 minute, his balance is $74. ↓ -1
- After 2 minutes, his balance is $73. ↓ -1
- After 3 minutes, his balance is $72.

rate is -1

Which function represents the balance on the phone after n minutes?

"zero term" is $75

A. $A(n) = -n + 75$

B. $A(n) = n + 75$

C. $A(n) = -n + 76$

D. $A(n) = n$

2. **(FIFA3) Answer the question below.**

In a certain game, Kevin repeatedly rolls a standard six-sided number cube until a 6 appears. Let the sequence a_n represent the probability that he needs exactly n rolls, for $n \geq 1$. The first four terms of the sequence are shown below.

$n = 1, 2, 3, 4$

$$\frac{1}{6}, \frac{5}{36}, \frac{25}{216}, \frac{125}{1,296}, \cdots$$

(×5, ×5, ×5 between the first four terms; ×6, ×6, ×6 between the denominators)

In the space below, write an equation of the form $a_n = AB^n$ that represents this sequence of probabilities.

$a_n = \frac{1}{6}\left(\frac{5}{6}\right)^{n-1}$

Plug in 1 → $\frac{1}{6}\left(\frac{5}{6}\right)^{1-1} = \frac{1}{6}\left(\frac{5}{6}\right)^{0} = \frac{1}{6} \cdot 1$

$= \frac{1}{6}$ ✓

3. (FIFA3) Annotate the sequence below and write your answer in the space below.

What is the recursive formula for the following arithmetic sequence?

42, 48, 54, 60... (+6 +6 +6)

$t(1) = 42, \quad t(n+1) = t(n) + 6$

4. (NQA1) Show your work and box your answer for the problem below.

It takes Gretchen 275 seconds to travel 5,500 meters in her car. What is her rate of speed in kilometers per hour?

$$\frac{5{,}500\ m}{275\ sec} \times \frac{3600\ sec}{1\ hr} \times \frac{1\ km}{1000\ m} = \frac{19800{,}000\ km}{275000\ hr}$$

$$= 72\ \frac{km}{hr}$$

5. (NQA1) Annotate the problem below and set up the necessary ratios. Then, choose the best possible answer.

An automobile driver uses a turn signal for the last 100 feet before a turn, traveling an average of 20 miles per hour during this time. Which expression can be used to calculate the amount of time, in seconds, the driver uses the turn signal for this turn?

A. $\frac{100 \times 60}{20 \times 5,280}$ ← not seconds

B. $\frac{20 \times 60^2}{100 \times 5,280}$ ← ft × ft

C. $\frac{100 \times 60^2}{20 \times 5,280}$ ← 3600

D. $\frac{100 \times 5,280}{20 \times 60^2}$ ← ft × ft

$100\text{ft} \times \frac{1\text{hr}}{20\text{miles}} \times \frac{1\text{mile}}{5280\text{ft}} \times \frac{3600\text{ sec}}{1\text{hr}}$

↑ given info ↑ change feet to miles ↑ change hours to seconds

6. (NQA1) Show your work neatly in the space to the right of the table. Then, complete the table.

Kathryn and her family moved from the United States to South America and are getting accustomed to using metric measurements in everyday life. Complete the conversion for each situation described in the table. Use the information below for your calculations, and then round any decimals to the nearest whole number for your answers.

1 kg ≈ 2.20 pounds 1 km ≈ 0.62 miles

Situation	Conversion
buys 4 kg apples at the store	4 kg = 9 pounds
sees road sign that says 29 km to the next town	29 km = 18 miles
wants to drive a car at 55 miles/hr	55 miles/hr = 89 km/hr

$4\text{kg} \times \frac{2.2\text{lbs}}{1\text{kg}} = 8.8\text{lbs}$

$29\text{km} \times \frac{0.62\text{mi}}{1\text{km}} = 17.98\text{mile}$

$\frac{55\text{mi}}{\text{hr}} \times \frac{1\text{km}}{0.62\text{mi}} = \frac{55\text{ km}}{0.62\text{ hr}} = 88.71\frac{\text{km}}{\text{hr}}$