**Lower Elementary:**

*Question:* Napoleon is practicing his tetherball skills. Every time he hits the ball, it takes 6 seconds to swing back around the pole. How many times can Napoleon hit the ball in 45 seconds?

**Upper Elementary:**

*Question:* Deb usually shoots glamour portraits for $26.00, but today they are discounted at 75% off. How much do glamour portraits cost today?

**Middle School:**

*Question:* Pedro is running for class president. Right now, one out of every twelve of the students in Pedro’s class plan to vote for him. He has one opponent and five weeks to campaign. If there are 144 students in his class, then how many more students does he need to convince to vote for him in order to win the election?

**Algebra and Up:**

*Question:* Rico throws a football into the air. The football’s height above the ground in meters after a given amount of time in seconds ***t*** can be found using the function *f*(***t***) = –5***t***² + 15***t*** + 2. How long does the football stay in the air after Rico throws it? You may use your calculator. Round your answer to the nearest tenth of a second.

**Lower Elementary:**

*Question:* Napoleon is practicing his tetherball skills. Every time he hits the ball, it takes 6 seconds to swing back around the pole. How many times can Napoleon hit the ball in 45 seconds?

*Answer:* 8 times

*Solution:* If we count up by 6s from 0, we find each second mark when Napoleon hits the ball. Napoleon hits the ball at 0, 6, 12, 18, 24, 30, 36, and 42 seconds. The next time he would hit the ball would be at 48 seconds, which is more than 45 seconds. So, if we count up the times that Napoleon hits the ball, we find that he can hit it 8 times.

**Upper Elementary:**

*Question:* Deb usually shoots glamour portraits for $26.00, but today they are discounted at 75% off. How much do glamour portraits cost today?

*Answer:* $6.50

*Solution:* Since 75% is the same as ¾, the price of the discounted glamour portraits is ¼ the original price. So, the glamour portraits cost $26.00 ÷ 4 = $6.50.

**Middle School:**

*Question:* Pedro is running for class president. Right now, one out of every twelve of the students in Pedro’s class plan to vote for him. He has one opponent and five weeks to campaign. If there are 144 students in his class, then how many more students does he need to convince to vote for him in order to win the election?

*Answer:* 61 more votes

*Solution:* Pedro has one opponent, so he needs more than half of the students to vote for him in order to win. He already has one-twelfth of the votes, so five-twelfths more would bring him up to half, and one more than that would win him the election. So, since five-twelfths of 144 is 60, he would need 60 + 1 = 61 more votes to win.

**Algebra and Up:**

*Question:* Rico throws a football into the air. The football’s height above the ground in meters after a given amount of time in seconds ***t*** can be found using the function *f*(***t***) = –5***t***² + 15***t*** + 2. How long does the football stay in the air after Rico throws it? You may use your calculator. Round your answer to the nearest tenth of a second.

*Answer:* 3.1 seconds

*Solution:* To find the amount of time the ball stays in the air, we find the values of ***t*** that put the ball 0 feet above the ground by solving for *f*(***t***) = 0. We can use the quadratic formula and our calculators to find that when –5***t***² + 15***t*** + 2 = 0, ***t*** can be either a negative value or ~3.1279... seconds. So, the ball is in the air for approximately 3.1 seconds.