Answers for Grade 10 Group Assignments - Quarter #3

<u>Notes</u>:

- Answers for group assignment problems that are out of the workbook can be found in the file titled "G10 Answers…".
- This answer key doesn't include all answers.

Week 18

- Answer to "new quadrilateral question": $630\,\text{cm}^2$

Week 19

- No answers needed.

Week 20

- No answers needed.

Week 21

1) *Math Magic Trick.*

   a) The 7$^{\text{th}}$ number in the list

   b) The ten numbers in the list (expressed as variables) are:

   x, y, x+y, x + 2y, 2x+3y, 3x+5y, 5x+8y, 8x+13y, 13x+21y, 21x+34y

   If you add all of these ten numbers/variables together, you get $55x + 88y$

   Dividing by 11 gives us $5x + 8y$, which is also the 7$^{\text{th}}$ number in the list.

2) *Average Speed Puzzle.*

   We can derive two equations from the given information: $75(\text{T} - \frac{1}{30}) = \text{D}$ and $65(\text{T} + \frac{1}{30}) = \text{D}$, where T is the amount of time it would take to be exactly on time,
   D is the distance from her house to work, and $\frac{1}{30}$ of an hour is used in place of 2 minutes. Solving these two equations gives us

   $\text{T} = \frac{7}{15}$ hour, or 28 minutes. This means that when she drives 65, it takes $\frac{7}{15} + \frac{1}{30} = \frac{1}{2}$ hour to get to work. Therefore, D = 65·½ = <u>32½ km</u>.

3) *The Three Lights Puzzle.*

   Call the switches A, B, C. Turn on switch A and switch B. After 5 minutes, turn off switch B, and then walk into the room. Quickly feel the two light bulbs that are off; the warm one is controlled by switch B, and the other lamp that is off, is controlled by switch C. The lamp that is on is controlled by switch A.

Week 22

- No answers needed.

Week 23

1) They are all similar, so their angles are all the same, and the ratios of the sides are all the same.
2) We set up a proportion (equation with equal ratios).
3) Because then the "opposite" (short) side is actually the Sin of the angle, which is very convenient!
4) $\sin 80° \approx 0.985$
5) $x^2 = 1^2 - 0.4226^2 \rightarrow x = \sin 65° \approx 0.906$
6) Sin $\rightarrow$ "The **opposite** side is how much of the **hypotenuse**?"
   Cos $\rightarrow$ "The **adjacent** side is how much of the **hypotenuse**?"

7) a) $\sin 20° \approx 0.342$ b) $\cos 23° \approx 0.920$ c) $\cos 50° = \sin 40° \approx 0.643$; $\sin 50° = \cos 40° \approx 0.766$

   d) $\cos 46.4° = \sin 43.6° \approx \frac{20}{29}$; $\sin 46.4° = \cos 43.6° \approx \frac{21}{29}$

9) a) 3.9438 b) 1.3746 c) 55.298 d) 55.298 e) 12.207 f) 22.989

Week 24

- No answers needed.