Answers
for Grade 8 Group Assignments - Quarter #4

Notes:

- Answers for group assignment problems that are out of the workbook can be found in the "G8 Workbook Answer Key".
- This answer key doesn't include all answers.

Week #25

Very Large Hotel. Note: August has 31 days.

a) 2^{30} = 1,073,741,824.
b) It became half full on August 30.

Week #26

Tennis Club. We are looking for the smallest number (X) that is divisible by all of the numbers 1 through 8 (i.e., the numbers 1 through 8 must be factors of X).

The smallest such number has the prime factorization $2^3 \cdot 3 \cdot 5 \cdot 7$, which is 840.

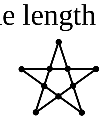
They will all play again after 840 days.

Week #27

Brick Laying. A single brick is 7 inches by 10½ inches.

Week #28

Jill's Bike Ride. The distance from the second sign to Manson is $^{1}/_{5}$ of the whole distance (Brownsville to Manson). Therefore, the second sign to Gilpin is $^{2}/_{5}$ of the whole distance, and the remaining distance (Brownsville to Gilpin) is $^{2}/_{5}$ of the whole distance. Since the distance from the first sign to Gilpin is twice as far as the distance from the first sign to Brownsville, the first sign must be ⅓ of the way from Brownsville to Gilpin. And since we just said that Brownsville to Gilpin is $^{2}/_{5}$ of the whole trip, we now know that Brownsville to the first sign must be $^{2}/_{15}$ (= ⅓ · $^{2}/_{5}$) of the whole trip, and the distance from the first sign to Gilpin must be $^{4}/_{15}$ of the whole trip. Therefore, the distance between the two signs must be ⅔ (= $^{2}/_{5}$ + $^{4}/_{15}$) of the distance of the whole trip, or, stated in reverse, the distance of the whole trip must be $^{3}/_{2}$ of the distance between the signs, which we know is 24 miles. So the length of the whole trip is $^{3}/_{2} \cdot 24$ or 36 miles.

Arranging Points. 

Week #29

Most of these problems will be talked about in the upcoming lectures and assignments.

Clock Hands. (Which will also be talked about in lecture #2.)

Method #1: Start by asking: "When exactly are the hands together between 4 and 5 o'clock? Imagine that at exactly 4:00 a race begins where the minute hand sets off to catch up with the hour hand. Since there are 60 tick marks on the clock, we can set our standard of measurement to one "tick mark", and say that the minute hand is moving at a rate of 60 ticks/hr and the hour hand is moving at a rate of 5 ticks/hr. The minute hand is therefore catching up at a rate of 55 ticks/hr. Given that the minute hand started out 20 tick marks behind the hour hand, the amount of time for the minute hand to catch up is 20 ticks ÷ 55 ticks/hr, which is $^{4}/_{11}$ of an hour, or 21 $^{9}/_{11}$ minutes. Therefore, the hands are exactly together at 4:21 $^{9}/_{11}$. Similarly, we can find the other places where the hands come together.

Method #2: We can first figure out that there are 11 times over the course of 12 hours where the hands come together. Therefore, 12÷11 equals 1 $^{1}/_{11}$ of an hour, which means that the hands come together at 1:05 and $^{5}/_{11}$, and then at 2:10 and $^{10}/_{11}$, 3:16 and $^{4}/_{11}$, 4:21 and $^{9}/_{11}$, 5:27 and $^{3}/_{11}$, 6:32 and $^{8}/_{11}$, 7:38 and $^{2}/_{11}$, 8:43 and $^{7}/_{11}$, 9:49 and $^{1}/_{11}$, 10:54 and $^{6}/_{11}$., and (finally!) back together at 12:00.

Week #30

All of these problems will be talked about in the upcoming lectures and assignments.

Week #31

All of these problems will be talked about in the upcoming lectures and assignments.

Week #32

For Tuesday:

1. Some possible answers:
   $128\ (=2^7)$; $78125\ (=5^7)$; $297\ (=3^3\cdot 11)$; $6655\ (=11^3\cdot 5)$; 1105

2. Some possible answers:
   $64\ (=2^6)$; $1771561\ (=11^6)$

3. $3600\ (=2^4\cdot 3^2\cdot 5^2)$

For Thursday:

4. Prime factorization method: $80=2^4\cdot 5$; $48=2^4\cdot 3 \rightarrow$ GCF $=2^4=$ **16**

   Remainder Theorem method: $48, 80 \xrightarrow[1\,r\,32]{} 32, 48 \xrightarrow[1\,r\,16]{} 16, 32 \xrightarrow[2\,r\,0]{} 0, 16 \rightarrow$ GCF = **16**

5. Prime factorization method: $29400=2^3\cdot 3\cdot 5^2$ $192500=2^2\cdot 5^4\cdot 7\cdot 11 \rightarrow$ GCF $=2^2\cdot 5^2\cdot 7=$ **700**
   Remainder Theorem method:

   $29400, 192500 \xrightarrow[6\,r\,16100]{} 16100, 29400 \xrightarrow[1\,r\,13300]{} 13300, 16100 \xrightarrow[1\,r\,2800]{} 2800, 13300$

   $\xrightarrow[4\,r\,2100]{} 2100, 2800 \xrightarrow[1\,r\,700]{} 700, 2800 \xrightarrow[4\,r\,0]{} 0, 700 \rightarrow$ GCF = **700**

6. $y = 3$

7. $x=\frac{27}{5}$ or $5\frac{2}{5}$

8. $y=-\frac{11}{6}$ or $-1\frac{5}{6}$

10.

X	Y
17	-5
13	-2
9	1
5	4
1	7
-3	10
-7	13, **etc.**