Math Olympiad Beginner
Homework 14

Name _____

1. Two trains leave from the same station at 10:00 am and move in the same direction along parallel tracks. One train averages 72 km/hr and other averages 108 kn/hr. How far apart will the trains be at 1:05 pm of the same day?

2. Two passenger trains traveling in opposite directions meet and pass each other. Each train is 1/12 mile long and is traveling at 50 mph. How many **seconds** after the front parts of the trains meet will their rear parts pass each other?

3. A man left his home and drove along a certain road at 48 km/hr. One hour later his son left the same home and drove along the same road in the same direction at 72 km/hr. How many **hours** does the son need to overtake his father?

4. A passenger train and freight train leave at the same time from stations that are 270 km apart. The trains are traveling towards each other, and the rate of the passenger train is twice the rate of the freight train. If the trains pass each other in three hours, what is the rate of **slow** train?

5. Suppose that a printer is using an old-style printing press and needs one piece of type for each digit in the page number of a book. A certain book contains pages numbered from 1 to 375. How many 4s will the printer need?

6. One section of a certain book contains six pages. The sum of all the page numbers in this section is 513. What is the lowest page numbers?

7. A train is moving at the rate of 1 mile in 1 minute and 20 seconds. If the train continues at this rate, how far will it travel in one hour?

8. A train traveling at 30 miles per hour reaches a tunnel which is 9 times as long as the train. If the train takes 2 minutes to completely clear the tunnel, how long is the train in feet? (1mile = 5280 ft)

9. How many even numbers between 1 and 101 are multiples of 3?

10. An old-model machine can stamp 1000 parts in four hours. A new-model machine can stamp 1000 parts in just two hours. How long will it take (in minutes) one old-model and one new-model machine to stamp 1000 parts working together?

11. It takes three minutes to fill a tub to the top and four minutes to drain the full tub. If the faucet and drain are both open, how long will it take (in minutes) to fill the tub?

12. It takes nine days for eight workers to pave a stretch of road. If each worker works at the same rate as each of the others, how long will it take (in days) twelve workers to pave the same stretch of road?

13. A company payroll is prepared by two computers in 13 1/3 min. Working alone, the faster of the two computers can prepare the payroll in 20 min. How much time (in minutes) does the slower computer alone require to prepare the payroll?

14. A group of six scouts purchases rations sufficient for a 15-day camping trip. If three more scouts join the group but no additional rations are purchased, how many days will the rations last?

15. A certain clock loses six minute every hour. One day this clock is set to the correct time at 10:30 am. What will be the correct time when the clock first shows 12:00 on that same day? (1:00 pm will be entered as 1300)

16. One afternoon Maria observed that the time that had elapsed since noon was equal to half the time that remained until midnight. What time was it?

17. A work crew of 3 people require 3 weeks and 2 days to do a certain job. How long would it take a work crew of 4 people to do the same job if each person of both crews works at the same rate as each of the others? (Note: each weeks contains six work days).

18. A motorist made a 60-mile trip averaging 20 miles per hour. On the return trip, he averaged 30 miles per hour. What was the motorist's average speed for the entire trip?

19. One light flashes every 2 minutes and another light flashes every 3 ½ minutes. Suppose both lights flash together at noon, what is the first time after 1 pm that both lights will flash together?

20. What is the degree-measure of the angle between the hour and minute hands at 6:20 pm?