Quant Live Session 2

Quant 2 – Live Session

Arithmetic Part 2

Time and Work, Time Speed and Distance (TSD), Rates, Ratios, Miscellaneous

You must have solved each of the questions extremely thoroughly before the first live class

Also, check the Answerkey, and think hard on each question

Quant Session 2

Standard directions for all Data Sufficiency Questions:

Mark:

A. Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
B. Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
C. BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
D. EACH statement ALONE is sufficient.
E. Statements (1) and (2) TOGETHER are not sufficient.

1. Lexy walks 5 miles from point A to point B in one hour, then bicycles back to point A along the same route at 15 miles per hour. Ben makes the same round trip but does so at half of Lexy's average speed. How many minutes does Ben spend on his round trip?

A. 40
B. 80
C. 120
D. 160
E. 180

2. Dan runs along a 2-mile stretch of river and then swims back along the same route. If Dan runs at a rate of 10 miles per hour and swims at a rate of 6 miles per hour, what is his average rate for the entire trip in miles per minute?

A. 1/8
B. 2/15
C. 3/15
D. 1/4
E. 3/8

3. What is the distance between Harry's home and his office?

(1) Harry's average speed on his commute to work this Monday was 30 miles per hour.

(2) If Harry's average speed on his commute to work this Monday had been twice as fast, his trip would have been 15 minutes shorter.

4. The ‘moving walkway’ is a 300-foot-long conveyor belt that moves continuously at 3 feet per second. When Bill steps on the walkway, a group of people that are also on the walkway stands 120 feet in front of him. He walks toward the group at a combined rate (including both walkway and foot speed) of 6 feet per second, reaches the group of people, and then remains stationary until the walkway ends. What is Bill’s average rate of movement (ft/sec) for his trip along the moving walkway?

A. 2
B. 2.5
C. 3
D. 4
E. 5

5. John and Jacob set out together on bicycle traveling at 15 and 12 miles per hour, respectively. After 40 minutes, John stops to fix a flat tire. If it takes John one hour to fix the flat tire and Jacob continues to ride during this time, how many hours will it take John to catch up to Jacob assuming he resumes his ride at 15 miles per hour? (Consider John's deceleration/acceleration before/after the flat to be negligible)

A. 3
B. 3.33
C. 3½
D. 4
E. 4½

6. During a 40-mile trip, Marla traveled at an average speed of x miles per hour for the first y miles of the trip and at an average speed of 1.25x mph for the last 40-y miles of the trip. The time that Marla took to travel the 40 miles was what percent of the time it would have taken her if she has traveled at an average speed of x miles per hour for the entire trip?

(1) $x = 48$ (2) $y = 20$

7. If it took Carlos ½ hour to cycle from his house to the library yesterday, was the distance he cycled greater than 6 miles?
   1 mile = 1760 yards
   1 yard = 3 feet

(1) The average speed at which Carlos cycled from his house to the library yesterday was greater than 16 feet per second.

(2) The average speed at which Carlos cycled from his house to the library yesterday was less than 18 feet per second.

8. A hiker walking at a constant rate of 4 miles per hour is passed by a cyclist travelling in the same direction along the same path at a constant rate of 20 miles per hour. The cyclist stops to wait for the hiker 5 minutes after passing her while the hiker continues to walk at her constant rate. How many minutes must the cyclist wait until the hiker catches up?

A. 6.66

B. 15

C. 20

D. 25

E. 26.66

9. A boat traveled upstream a distance of 90 miles at an average speed of (v – 3) miles per hour and then traveled the same distance downstream at an average speed of (v + 3) miles per hour. If the trip upstream took half an hour longer than the trip downstream, how many hours did it take the boat to travel downstream?

A. 2.5
B. 2.4
C. 2.3
D. 2.2
E. 2.1

10. The table shows the car rental charges at Thrifty Agency. The daily rate applies for each day or fraction of a day in excess of any multiple of a 7-day week, up to the charge per week. If Olga rented a car of one of the types indicated, which type was it?

(1) Olga's total rental charge, based only on the rates specified, was $184.

(2) Olga rented the car for 10 days.

CAR RENTAL CHARGES AT THRIFTY AGENCY		
Car Type	Charge per day	Charge per Week (7 days)
Economy	$28	$100
Compact	$30	$120
Midsize	$32	$140
Standard	$34	$160
Luxury	$39	$200

11. A certain truck traveling at 55 miles per hour gets 4.5 miles per gallon of diesel fuel consumed. Traveling at 60 miles per hour, the truck gets only 3.5 miles per gallon. On a 500-mile trip, if the truck used a total of 120 gallons of diesel fuel and traveled part of the trip at 55 miles per hour and the rest at 60 miles per hour, how many miles did it travel at 55 miles per hour?

A. 140

B. 200

C. 250

D. 300

E. 360

12. A car traveled 462 miles per tankful of gasoline on the highway and 336 miles per tankful of gasoline in the city. If the car traveled 6 fewer miles per gallon in the city than on the highway, how many miles per gallon did the car travel in the city?

(A) 14

(B) 16

(C) 21

(D) 22

(E) 27

13. When a certain stretch of highway was rebuilt and straightened, the distance along the stretch was decreased by 20 percent and the speed limit was increased by 25 percent. By what percent was the driving time along this stretch reduced for a person who always drives at the speed limit?

A. 16%
B. 36%
C. 37%
D. 45%
E. 56%

14. Machine A and Machine B can produce 1 widget in 3 hours working together at their respective constant rates. If Machine A's speed were doubled, the two machines could produce 1 widget in 2 hours working together at their respective rates. How many hours does it currently take Machine A to produce 1 widget on its own?

A. 1/2
B. 2
C. 3
D. 5
E. 6

15. Tom, working alone, can paint a room in 6 hours. Peter and John, working independently, can paint the same room in 3 hours and 2 hours, respectively. Tom starts painting the room and works on his own for one hour. He is then joined by Peter and they work together for an hour. Finally, John joins them and the three of them work together to finish the room, each one working at his respective rate. What fraction of the whole job was done by Peter?

A. 1/9
B. 1/6
C. 1/3
D. 7/18
E. 4/9

16. Machine A can fill an order of widgets in a hours. Machine B can fill the same order of widgets in b hours. Machines A and B begin to fill an order of widgets at noon, working together at their respective rates. If a and b are even integers, is Machine A's rate the same as that of Machine B?

(1) Machines A and B finish the order at exactly 4:48 p.m.

(2) $(a + b)^2 = 400$

17. Six machines, each working at the same constant rate, together can complete a certain job in 12 days. How many additional machines, each working at the same constant rate, will be needed to complete the job in 8 days?

A. 2
B. 3
C. 4
D. 6
E. 7

18. Pumps A, B and C operate at their respective constant rates. Pumps A and B, simultaneously, can fill a certain tank in 6/5 hours. Pump A and C, operating simultaneously, can fill the tank in 3/2 hours; and pumps B and C, operating simultaneously, can fill the tank in 2 hours. How many hours does it take pumps A, B, and C, operating simultaneously, to fill the tank?

A. 1/3
B. 1/2
C. 2/3
D. 5/6
E. 1

19. In the first 2 hours after Meadow's self-service laundry opens, m large washing machines and n small washing machines are in continual use. Including the time for filling and emptying the washing machines, each load of laundry takes 30 minutes in a large washing machine and 20 minutes in a small washing machine. What is the total number of loads of laundry done at Meadow's self-service laundry during this 2-hour period?

(1) $n = 3m$

(2) $2m + 3n = 55$

20. Machines X and Y run at different constant rates, and machine X can complete a certain job in 9 hours. Machine X worked on the job alone for the first 3 hours and the two machines, working together, then completed the job in 4 more hours. How many hours would it have taken machine Y, working alone, to complete the entire job?

A. 18
B. 13½
C. 7⅕
D. 4½
E. 3⅔

21. It takes Jack 2 more hours than Tom to type 20 pages. If working together, Jack and Tom can type 25 pages in 3 hours, how long will it take Jack to type 20 pages?

A. 6
B. 7
C. 8
D. 10
E. 5

22.How much time did it take a certain car to travel 400 kilometers?

1. The car traveled the first 200 kilometers in 2.5 hours.

2. If the car's average speed had been 20 kilometers per hour greater than it was, it would have traveled the 400 kilometers in 1 hours less time than it did.

23. If a car traveled from Townsend to Smallville at an average speed of 40 mph and then returned to Townsend later that evening, what was the average speed for the entire trip?

1. The return trip took 50% longer than the trip initial trip.
2. The distance from Townsend to Smallville is 165 miles.

24. Six technicians take a total 10 hours to build a new server, with each working at the same rate. If the six technicians start to build the server at 11:00 AM, and one technician per hour is added beginning at 5:00 PM, at what time will the server be completed?

A. 6:40 PM

B. 7:00 PM

C. 7:20 PM

D. 8 PM

E. 8:15 PM

25. Pascal has 96 miles remaining to complete his cycling trip. If he reduced his current speed by 4 miles per hour, the remainder of the trip would take him 16 hours longer than it would if he increased his speed by 50%. What is his current speed?

A. 8

B. 10

C. 12

D. 16

E. 6

26. Half an hour after Car A started traveling from Newtown to Oldtown, a distance of 62 miles, Car B started traveling along the same road from Oldtown to Newtown. The cars met each other on the road ¼ hours after Car B started its trip. If Car A traveled at a constant rate that was 8 miles per hour greater than Car B's constant rate, how many miles had Car B driven when they met?

A. 14
B. 12
C. 10
D. 9
E. 8

27. Two boats, traveling at 5 and 10 kilometers per hour respectively, head directly towards each other. How far apart are they (in kilometers) one minute before they collide?

A. 1/12
B. 1/6
C. 1/4
D. 1/3
E. 1/2

28. Working together, printer A and printer B can finish a task in 24 minutes. Printer A alone can finish the same task in 60 minutes. How many pages does the task contain if printer B prints 5 pages a minute more than printer A?

A. 600
B. 800
C. 1000
D. 1200
E. 1500

29. If Bob produces 36 or fewer items in a week, he is paid X dollars per item. If Bob produces more than 36 items in a week, he is paid X dollars per item for the first 36 items and $1.5X$ for each additional item. How many items did Bob produce last week?

1. Last week Bob was paid total of $480 for the items that he produced (in the same week).
2. This week Bob produced 2 items more than last week and was paid a total of $30 extra for the items that he produced this week.

30. A certain city with population of 132,000 is to be divided into 11 voting districts, and no district is to have population that is more than 10 percent greater than the population of any other district. What is the minimum possible population that the least population district could have?

A. 10700
B. 10800
C. 10900
D. 11000
E. 11100

31. The ratio of boys to girls in Class A is 3 to 4. The ratio of boys to girls in Class B is 4 to 5. If the two classes were combined, the ratio of boys to girls in the combined class would be 17 to 22. If the number of boys in Class B is one less than the number of boys in Class A, and if the number of girls in Class B is two less than the number of girls in Class A, how many girls are in Class A?

A. 8
B. 9
C. 10
D. 11
E. 12

32. Bag A contains red, white and blue marbles such that the red to white marble ratio is 1:3 and the white to blue marble ratio is 2:3. Bag B contains red and white marbles in the ratio of 1:4. Together, the two bags contain 30 white marbles. How many red marbles could be in bag A?

A. 1
B. 3
C. 4
D. 6
E. 8

1. D
2. A
3. C
4. E
5. B
6. B
7. E
8. C
9. A
10. A
11. E
12. B
13. B
14. E
15. E
16. A
17. B
18. E
19. B
20. A
21. A
22. B
23. A
24. D
25. A
26. A
27. C
28. A
29. E
30. D
31. E
32. D

General Discussion + Agenda for the upcoming class