**Solutions**

1. Let x = leather jackets and y = bell-bottom jeans. We have a system of equations where:

3x + 5y = 277.75 (1)

5x + 3y = 328.25 (2)

Multiplying (1) by 3 and (2) by 5, we get:

9x + 15y = 833.25

25x + 15y = 1641.25

Subtract (2) - (1) to get:

16x = 808

x = 50.50

**$50.50, B**

2. Since Fanta peach is 38% sugar and Jack fills his cup up with 5 fl oz of it, 1.9 fl oz consists of sugar. Similarly, Fanta raspberry is 40% sugar so 2 of the 5 fl oz consists of sugar. Jack’s total drink mix is 15 fl oz with 39% sugar, or 5.85 fl oz of sugar. This means that Fanta cherry contains the missing amount of sugar, 5.85 - 1.9 - 2 = 1.95 fl oz. Therefore, the percentage of Fanta cherry that consists of sugar is = 0.39 or **39%, D**

3. Factoring the quadratic gives us:

(x-11)(x-12) = 0

Since “A Farewell to Arms” costs more, Wesley bought it for **$12, C**

4. To find the maximum or minimum of a quadratic, find and plug it in for x. . Plugging this in for x, we get:

2x2 - 8x + 11

2(2)2 - 8(2) + 11

=

= **, A**

5. Solving the inequality for t gives us:

3 ≤ ≤ 7

9 ≤ ≤ 49

27 ≤ 5t-9 ≤ 147

36 ≤ 5t ≤ 156

7.2 ≤ t ≤ 31.2

Therefore, the longest video Lindsay can watch is **31.2 minutes long, C**

6. First, we need to list the data from least to greatest. Calculating the median (number in the middle of the data set) gives us = 63.5. The mode (most common number in the set) is 59. Finally, the range (difference between the least and greatest number in the set) is 73-59 = 14. Therefore, the average of the median, mode, and range is = **45.5, A**

7. The closest distance between two points on a graph is a line. Using the distance formula d = we can plug in the two points to get:

d =

=

=

=

= **5, A**

8. Since 65% of one hogan is clay, 35% is wood. If the total amount of materials is *x*, then , since 35% of the total weight is wood. Solving for *x* we see that . Then the total amount of clay is **B**

9. To simplify we need to put both fractions in a common denominator:

=

= **, A**

10. The prime factorization of 20020 is 22 \* 5 \* 7 \* 11 \* 13. Therefore, 20020 has **5 distinct prime factors, C**

11. The rate and time needed to finish the job can be written as:

R1t + R2t + R3t = 1

R1 + R2 + R3 = 1/t

Since it takes Dylan 5 hours to finish the job by himself, he works at a rate of ⅕ of the job done per hour. Similarly, Jose works at a rate of ⅙ per hour. They have a total time of t to get the job done together; in this case, 2 hours. Plugging these numbers into our equation gives us:

(⅕) + (⅙) + R3 = ½

R3 =

This rate shows us that Nick can finish of the job in one hour if he works by himself. Therefore, it would take him **7.5 hours to complete the job by himself, D**

12. Since there are 12 teams in the league, any of the 12 can get 12th place. However, we know that the bottom 5 placements have already been decided After one team comes up in 7th place, any of the other 6 could end up in 6th place. This pattern continues until 1 team wins 1st place. Therefore, the number of different placings possible in the league is simply

7! = 7 \* 6 \* 5 \* … \* 3 \* 2 \* 1 = **5040, C**

13. The equation in the question gives us the height of the firework. Setting it equal to 12, we can see at what times the firework is 12 feet high:

-t2 + 8t = 12

-t2 + 8t - 12 = 0

t2 - 8t + 12 = 0

(t-2)(t-6) = 0

**t = 2, 6, C**

14. Since 1 gram of gold is $50, $3500 is 70 grams of gold. Since April can find 7 grams of gold every 4 hours, it will take her 40 hours to earn 70 grams or $3500. Since Dimitria can find 5 grams of gold every 3 hours, it will take her 42 hours to earn 70 grams or $3500. Finally, Tina can find 2 grams every 1.5 hours, so it will take her 52.5 hours to earn 70 grams or $3500. Therefore, **April will make $3500 the fastest, A**

15. In order to find the midpoint between two points of a line segment, you can simply use the midpoint formula, midpoint = Plugging in the coordinates of New Orleans and Chicago, we get:

Midpoint =

=

= **(3.5, -2.5), C**

16. Looking at the sequence we notice that 6×3 = 18, 18/2 = 9, 9×3 = 27, 27/2 = 13.5, and so on. According to the pattern, the next number in the sequence would be 20.25×3 = **60.75, D**

17. The total combination of outfits is simply the product of all the types of clothes he has. 5 × 3 × 4 × 2 = **120, E**

18. Absolute equations have multiple solutions due to the properties of the absolute function. First, we can simply the equation a little:

There are two cases to solBve for. The first case:

|x-11| = 16

x-11 = 16

x = 27

The second case:

|x-11| = 16

x-11 = -16

x = -5

Therefore, the sum of the solutions of the equation is 27 + (-5) = **22, B**

19. To find the slope of the line that corresponds to Auska’s route, we need to first put the equation in slope-intercept form:

3x - 5y = 15

-5y = -3x + 15

y = x - 3

The slope of the line that Auska runs is . Since Kayden’s route is perpendicular to Auska’s, his slope will be the opposite reciprocal of Auska’s, or . The sum ofand is + = - = **, E**

20. Deep travels at 200 mph so he will complete 50 laps, or 125 miles, in 37.5 minutes. Since Dev is 20 laps behind Deep, he needs to complete 70 laps in total to catch up. Since each lap is 2.5 miles, 70 laps is equal to 175 miles. Since Dev needs to travel 175 miles in 37.5 minutes, this is the same as **280 miles per hour, D**

21. The only common factor between 309 and 15 is 3. When you divide both numbers by 3 you are left with **, A.**

22. The circumference of this race track is 2π times the radius. This gives us 1200π feet. If Sandhya starts halfway around the track she only has to travel 600π feet. At 12π feet per second she will reach the finish line at the 50 second mark. Surabhi has to travel the full 1200π feet distance, and at 30π feet per second she will reach the finish line at the 40 second mark. This means that **Surabhi will finish first**, 10 seconds ahead of Sandhya. If she finishes 10 seconds ahead that means that Sandhya still has 10\*12π feet left to travel **(120π feet), C**

23. yields **, A.**

24. One pound is equal to 16 ounces. But since that we would be multiplying both weights by 16 they would cancel out anyways. So we can just divide both weights by the GCF which is 20. After dividing both by 20 the ratio would be **, C.**

25. First to figure out what Drew earned we must solve what John earned. 4 from 62 houses or 4×62 is equal to 248 dollars. If Drew earned 20 percent more than this we can multiply 248 by 1.2 to find how much he made which gives us 297.6. Adding both totals together gives us **$545.60, C.**

26. First things first you can divide the entire equation by 4 which then gives us:

From here we need to multiply the factors which gives us:

Now if we add like terms we can see we get: .

Since both sides are the same, we add 16 x + 7 to both sides which yields 0 = 0

This means there are **infinite solutions for x, D.**

27. To find the average rate of change of Tracy’s speed, all we have to do is divide the change from her original speed and her final speed which is 35, by the amount of time passed during this change which is 14 seconds. So the answer would be mph/s or **2.5 mph/s, A.**

28. To put 3,790,000 in scientific notation we need to move the decimal point so it is right before the 3. To do this we have to move the decimal point 6 spaces to the left. Which means the final simplified term will be **, C.**

29. To find the height we can take the equation,, and simplify to

After this we multiply the factors to get the new equation: .

We can now subtract 3x on both sides and add 4 to both sides to get 10 = x

Since we know the width is 3 times this, that means the width is 30 units.

30 units times 10 units yields **300 square units, B.**

30. If on Monday 300 new people visit. Tuesday will have 300×1.1 new visitors or 330 new visitors. If Tuesday had 330 new visitors, then Wednesday will have 330×1.1 new visitors or 363 new people visiting. If Wednesday had 363 new visitors, then Thursday will have 399.3 new visitors. Since you cannot have a fraction or a decimal visitor. The number of new visitors on Thursday will be **399 new visitors, C.**