

DKC³ 2007 WORD PROBLEM ANSWERS (5 PTS EACH)

1. SOCCER

There are five teams in the DKC soccer league and each team plays each of the others once a season. The table of stats kept by one of the members is as follows:

	<u>Won</u>	<u>Drawn</u>	<u>Lost</u>	<u>Goals For</u>	<u>Goals Against</u>
Arnsley	2	1	1	2	2
Boldham	3	1	0	2	1
Cleeds	1	3	0	1	0
Drochdale	1	2	1	1	1
Erby	1	0	3	1	3

Three of his numerical entries in the table are wrong. To answer the following question you will need to determine the errors. What were the scores of each team's four games?

ANSWER: Arnsley: 1-0, 1-0, 0-0, 0-2
Boldham: 0-1, 2-0, 0-0, 0-0
Cleeds: 1-0, 0-0, 0-0, 0-0
Drochdale: 1-0, 0-1, 0-0, 0-0
Erby: 1-0, 0-1, 0-1, 0-1

2. LOTTO LOSERS

Seven friends decided to try their luck on the Lottery. (Six numbers are drawn plus a bonus number.) They each chose six different numbers from 1 to 49. (None of them chose the same number.) If all six numbers were drawn, they would win millions; if five of their numbers, plus the bonus came up, they would win a few hundred thousand. Jeremy chose multiples of three. Bob's greatest number was ten. Carrie chose primes totaling 150. Tony and Nate each chose six consecutive numbers. Tony's being higher in value. Ryan chose multiples of seven. Eric chose square numbers. These unlucky friends failed to choose a single correct number (not even the bonus). If the bonus number was 1, which six numbers came up on the lottery?

ANSWER: 11, 20, 22, 26, 38, 40

3. CRYPTOGRAPHY

What does this message say?
G T Y O R J O T E O U I A B G T

ANSWER: "Great Job You Got It"

This type of code is known as a Caesar Box (Julius Caesar was the first to write codes this way.) To decipher the message, simply divide the code into four groups of four (you can also divide them into groups such as 5 groups of 5 or 6 groups of 6 depending on the number of letters in the phrase), and rearrange them vertically like this. Then you read vertically column by column.

G T Y O
R J O T
E O U I
A B G T

4. WHAT'S NEXT

F, M, A, M, J, J, A, S, O – What letter is next?

ANSWER: N – November

5. **TRAVIS'S TRIP**

The distance between Thief River Falls, MN and Williston, ND is 400 miles. At 2:00pm, Travis left Thief River Falls to go to Williston and Bob left Williston heading to Thief River Falls. They met at 4:30pm. While discussing their trip, they found that Travis's average speed was 10 miles per hour faster than Bob's average speed. What were their average speeds and how many miles did each of them travel?

ANSWER: Travis's average speed = 85 mph Bob's average speed = 75 mph
Travis's distance = 212.5 miles Bob's distance = 187.5 miles

6. **TAXI**

Conrad's Taxi Service charges \$1.50 for the first mile and \$.90 for each additional mile. How far could Mr. Kulp go for \$20 if he gives the driver a \$2 tip?

ANSWER: 19 1/3 Miles

7. **EQUATOR**

Pretend that the earth is a perfectly smooth sphere with a radius of 6,378 km (3959 mi). And the people on this earth have made a steel cable that goes all the way around the earth at the equator. They meant to make it fit perfectly, resting on the equator, all the way around. But they accidentally made it 1 meter (over 3 ft) too long. They decided to support the cable, so that it is exactly the same distance from the earth, all the way around. How high above the surface of the earth did they place the cable?

ANSWER: The answer is that the cable is $1/(2\pi)$ meters or about 0.159 meters above the surface of the earth.

8. **THREE NUMBERS**

Three numbers are such that the second is five more than the first, and the third is four less than three times the first. The sum of the numbers is 36. What are the numbers?

ANSWER: 7, 12, 17

9. **ICE CREAM**

Superman has an ice cream cone that has 5 scoops. Each of his 5 scoops is a different flavor of ice cream. The five flavors are blueberry, chocolate, strawberry, vanilla and bubble gum. You don't know the order of Superman's ice cream flavors. However, he has given you a few clues to see if you can figure out the order of the flavors. The bottom flavor has 10 letters. The vanilla scoop touches both the chocolate and blueberry scoop. Vanilla is below the chocolate scoop but above the bubblegum scoop. What is the order of the ice cream flavors from top to bottom?

ANSWER: Chocolate, Vanilla, Blueberry, Bubblegum, Strawberry

10. **SIMPLE INTEREST**

Luke Skywalker deposits \$8,000 in one simple interest account and \$2,000 in a second simple interest account. The interest rate on the \$8,000 account is 2% more than the rate on the \$2,000 account. If the total yearly amount of interest earned on the \$8,000 account is \$459 more than the interest earned on the \$2,000 account, find the interest rate on each account.

ANSWER: The interest rate on the \$2000 account is 4.983% and the interest rate on the \$8000 account is 6.983%.

11. **PUPPY PLAYGROUND**

Your backyard is a rectangle 20 yards wide and 40 yards long. Your puppy can run completely around the perimeter of the yard in 2 minutes. How fast is your puppy running, in miles per hour?

ANSWER: 2.045 miles/hour

12. GEARS

Wonder Woman is planning on competing in a marathon bicycle race and wants to optimize her training. The race course is very flat so she will not have to worry about switching gears to go up and down hills much. Her goal is to cruise at 24 miles per hour for the majority of the race, so she would like to know what cadence (in revolutions per minute) to do most of her training at. Bicycle gearing and speed is represented by these formulas:

$$\text{GearInches} = (\text{ChainRing} / \text{FreeWheel}) * \text{WheelDiameter}$$

$$\text{DistanceInches} = \text{GearInches} * 3.14$$

$$\text{DistanceFeet} = \text{DistanceInches} / 12$$

$$\text{PedalRotationsPerMile} = 5280 / \text{DistanceFeet}$$

$$\text{MilesPerHour} = (\text{Cadence} * 60) / \text{PedalRotationsPerMile}$$

Assuming Wonder Woman's bicycle has 26" diameter wheels and when she is in top gear her ChainRing has 53 teeth and her FreeWheel has 14 teeth, what cadence should she train at?

ANSWER: GearInches = (53/14)*26 = 98.43

DistanceInches = 98.43 * 3.14 = 309.07

DistanceFeet = 309.07/12 = 25.76

PedalRotationsPerMile = 5280/25.76 = 205

Per the last formula, Cadence = (MilesPerHour * PedalRotationsPerMile) / 60

So, Cadence = (24 * 205) / 60 = 82

13. FARMER BOB

Farmer Bob is harvesting his corn. This involves combining it, dumping it in a cart to be transferred to the trucks, and hauling it away. Bob also likes to get his corn stalks disced up afterwards in preparation for the next year. His combine can harvest 1600 bushels per hour, his cart can transfer 2000 bushels per hour, and his trucks can haul away 500 + (number of truck drivers * 500) bushels per hour. Bob generally has only two helpers, so he runs the combine, one runs the cart, and one drives the trucks (leaving the disc sitting with no driver). However, sometimes his friend Jason helps out by discing some of Bob's corn stalks for him. Assuming Bob and his two helpers have already harvested 55,000 bushels of corn, his average yield is 117 bushels per acre, the disc can shred 33 acres of corn stalks per hour, and Jason has 14 hours available to help Bob; how many acres of Bob's corn stalks will Jason be able to shred?

ANSWER: Jason theoretically could shred 33*14 = 462 acres of corn for Bob, assuming he has combined far enough ahead. Bob has combined 55,000/117 = 470 acres before Jason even starts, so the answer is 462 acres

14. DUCKS

Three ducks and two ducklings weigh 32 kg. Four ducks and three ducklings weigh 44kg. All ducks weigh the same and all ducklings weigh the same. What is the weight of two ducks and one duckling?

ANSWER: 20 Kgs

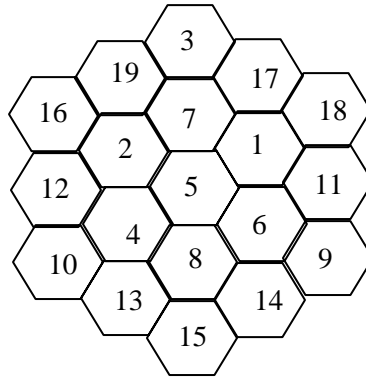
15. CAGES AND CANARIES

Jerry Springer owns a pet store. If he puts in one canary per cage, he has one bird too many. If he puts in two canaries per cage, he has one cage too many. How many cages and canaries does Jerry have?

ANSWER: 4 birds and 3 cages

16. MAGIC HEXAGON

Fill in the numbers so that every column or diagonal has the same sum. You can only use the numbers from 1 to 19 inclusive, and can use no number more than once.



17. MOON ROCKS

John Glenn and Buzz Aldrin each have a collection of moon rocks. John said that if Buzz would give him 9 of his moon rocks they would have an equal number; but, if John would give Buzz 9 of his moon rocks, Buzz would have 4 times as many moon rocks as John. How many moon rocks does Buzz have?

ANSWER: Buzz Aldrin has 39 moon rocks and John Glenn has 21 moon rocks.

18. MOUNTAIN GOAT

A mountain goat attempts to scale a cliff sixty feet high. Every minute the goat bounds upward 3 feet but slips back down two. How long does it take the goat to reach the top of the mountain?

ANSWER: 58 minutes. Although his progress each minute is one foot, he reaches the top on the fifty-eighth minute just before he would normally slip back two feet!!

19. LEMONADE

Captain Jack Sparrow has two cups, one containing orange juice and one containing an equal amount of lemonade. One teaspoon of the orange juice is taken and mixed with the lemonade. Then a teaspoon of this mixture is mixed back into the orange juice. Is there more lemonade in the orange juice or more orange juice in the lemonade?

ANSWER: There's the same amount of lemonade in the orange juice as orange juice in the lemonade. Each cup ends with the same volume of liquid that it started with, and there's still an equal amount of each juice between the two cups.

20. FERRYBOAT

The Nimrod Ferryboat is full when it has ten cars on board. It is also full when it has six trucks on board. The ferryboat never carries cars and trucks at the same time. The ferryboat made five trips across the river and was full on each trip. It carried a total of 42 cars and trucks across the river. How many cars did the Nimrod ferryboat carry all together in the five trips?

ANSWER: 30 cars

21. BANANAS

A grocery store has a sale on bananas. If Curious George buys six bananas, he gets the sale price. If the grocer has 489 bananas, how many bunches of six can he sell at sale price to Curious George? How many can be sold at regular price?

ANSWER: He can sell 81 bunches at the sale price and 3 bananas at regular price.

22. PEANUT BUTTER & JELLY

A math student interviewed 50 fifth graders. 41 said they like peanut butter sandwiches, 35 liked jelly sandwiches and 30 liked both peanut butter and jelly sandwiches. How many students liked neither?

ANSWER: 4

23. MATH BOOK

Betsy accidentally tore out a page of her math book. Her teacher, Mr. Mason asked her what page it was. Betsy said that the sum of the page numbers on the facing pages was 127. What are the page numbers on the pages Betsy tore out of her book?

ANSWER: 63 and 64

24. ALLOWANCE

Walter and his parents are a little unusual. If he does an acceptable job of doing his chores, he gets paid \$3.33 for that day. If he does an outstanding job, he gets \$3 more. During one 10 day period, Walter received \$42.30 for his work. How many days did Walter earn the extra money?

ANSWER: 3 days

25. GAS

A gas station owner has 30 gallons of gasoline worth \$1.20 per gallon. He also has some gasoline that is worth \$1.40 per gallon. How many gallons of the \$1.40 brand must the owner mix with \$1.20 brand to produce gasoline that costs \$1.28 per gallon?

ANSWER: 20 gallons of the \$1.40 per gallon gasoline.