Meet 9

Feb 91

CATEGORY 1
NUMBER THEORY
FEB, 1991

1. _____
2. _____
3. _____

1. FIND THE THIRTEENTH TERM OF THE FOLLOWING SEQUENCE: 1, 8, 27, 64...

2. FIND THE SUM OF THE FOLLOWING SERIES OF NUMBERS.

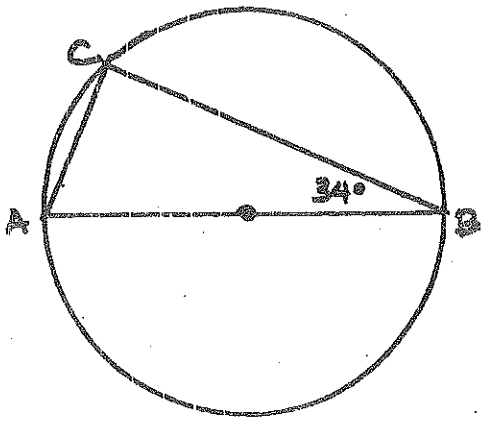
$$111 + 112 + 113 + 114 \ldots + 200$$

3. HOW MANY TERMS ARE IN THE SEQUENCE

6, 11, 16, 21, 26, 31, 36... 306

CATEGORY 2
GEOMETRY
FEB. 1991

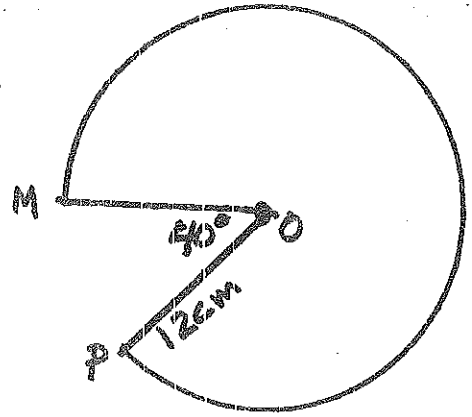
1 _____ °
2 _____ cm.
3 _____ in.



* $\overline{AB}$ IS A DIAMETER
* m∠ABC = 34°

WHAT IS m∠CAB?

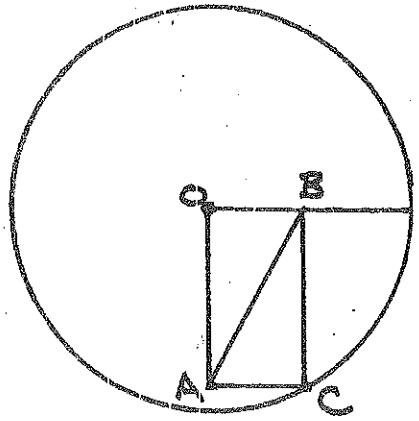
2.



FIND THE PERIMETER OF THIS FIGURE. ROUND TO THE NEAREST HUNDREDTH. USE 3.14 FOR π

* O IS THE CENTER
* m $\overline{OP}$ = 12 cm
* m∠MOP = 40°

3.



* O IS THE CENTER
* OBCA IS A RECTANGLE
* m $\overline{AB}$ = 3.8 in

FIND THE CIRCUMFERENCE OF THE CIRCLE. (USE 3.14 FOR π)

CATEGORY 3

MYSTERY

FEB 1991

1 _____

2 _____

3 _____

1. IF THE PRIME FACTORIZATION OF 133,518 IS $2 \cdot 3 \cdot 7 \cdot 11 \cdot 17^2$ AND THE PRIME FACTORIZATION OF 20,349 IS $3^2 \cdot 7 \cdot 17 \cdot 19$, WHAT IS THE LEAST COMMON MULTIPLE OF 133,518 AND 20,349?

2. 643,409,235,81a IS A TWELVE DIGIT NUMBER WHICH IS DIVISIBLE BY 12. WHAT DIGIT DOES a REPRESENT?

3. WHAT IS 5.4% of $6.\overline{6}$ TIMES $25\frac{5}{6}$?

CATEGORY 4
ARITHMETIC
FEB, 1991

1. _____
2. _____ %
3. _____

1. WHAT NUMBER IS $\frac{1}{4}$% OF 252?

2. MELVIN RECEIVED $5600 IN INTEREST FROM HIS $40,000 IN SAVINGS. WHAT WAS THE RATE OF INTEREST?

3. SALE PRICES AT DON'S DARN GOOD DISCOUNT DEPAIRTMENT STORE ARE NORMALLY 35% BELOW REGULAR RETAIL PRICES. ON TUESDAYS DON OFFERS AN ADDITIONAL 12% OFF THE SALE PRICE. WHAT WILL BE THE COST OF A $190 COMPACT DISC PLAYER IF IT IS PURCHASED ON TUESDAY?

CATEGORY 5

ALGEBRA

FEB, 1991

1. _____, _____, _____

2. _____

3. _____

1. FIND FOUR CONSECUTIVE ODD INTEGERS WHOSE SUM IS ZERO. LIST IN ORDER FROM SMALLEST TO LARGEST.

2. BEN AND JERRY, WHO LIVE 405 MILES APART, AGREE TO MEET. BOTH MEN LEAVE THEIR HOMES AT 8:00AM. TRAVELLING BY CAR, BEN AVERAGES 48 MPH AND JERRY AVERAGES 42 MPH. AT WHAT TIME DO THEY MEET?

3. A COIN BANK CONTAINS $21.73 IN PENNIES, NICKELS, DIMES AND QUARTERS. THERE ARE FIVE MORE NICKELS THAN PENNIES, TWICE AS MANY DIMES AS NICKELS, AND TWO MORE QUARTERS THAN DIMES. HOW MANY QUARTERS ARE IN THE BANK?

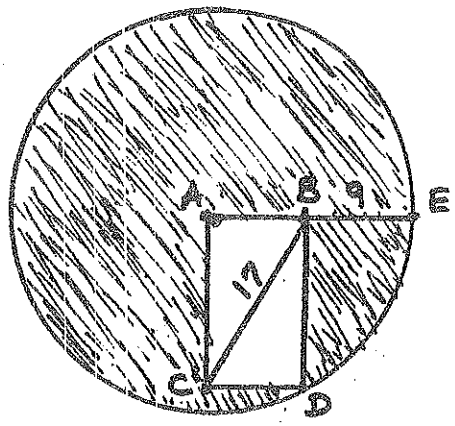
CATEGORY 6
TEAM QUESTIONS
FEB, 1991

1. A=
2. B=
3. C=
4. D=
5. E=
6. F=

1. TWO ANTS LEAVE THE ANT HILL AT THE SAME TIME. ANT X TRAVELS WEST AT A RATE OF 10 FEET PER MINUTE. ANT Y TRAVELS NORTH AT A RATE OF 24 FEET PER MINUTE. HOW MANY MINUTES WILL IT TAKE FOR THE DIRECT DISTANCE BETWEEN THEM TO BE 312 FEET?

2. IF YOU INVEST A SUM OF MONEY AT 10% INTEREST, HOW MANY YEARS WILL IT TAKE TO DOUBLE YOUR INVESTMENT?

3.



GIVEN:
A IS CENTER
ABCD IS A RECTANGLE
$m\overline{BE} = 9$
$m\overline{BC} = 17$

FIND:
AREA OF SHADED REGION
(ROUND TO NEAREST TENTH)
USE 3.14 FOR π

4. THE SUM OF THE DIGITS OF A 4 DIGIT NUMBER IS 6. NONE OF THE DIGITS IS ZERO. IF YOU ARE ALLOWED 4 GUESSES, WHAT IS THE PROBABILITY YOU WILL NOT GUESS THE CORRECT NUMBER? EXPRESS AS A LOWEST TERM FRACTION.

5. HOW MANY DIFFERENT ARRANGEMENTS ARE THERE FOR LETTERS IN THE WORD "CHAMPIONS" IF THE FIRST LETTER MUST BE "C" AND THE LAST LETTER MUST BE "S"?

6. $F = \dfrac{\dfrac{E/A}{B}}{-D} + C$

ANSWERS MEET 4 2/91

CAT 1 NUM. TH.

1. 2197 (That is 13^3)
2. 13995 $(200+111)\times 45$
3. 61 Each term equals $5\times(n-1)+6$ ∴ $5(n-1)+6=306$

n	term
1	5(0)+6
2	5(1)+6
3	5(2)+6 etc.

CAT 2 GEOM

1. 56° $m\angle B = 34°$ $m\angle C = 90°$ ∴ $m\angle A = 56°$
2. 90.99 cm. $m\overset{\frown}{AB} = m\overline{OC}$ ∴ $r = 3.8$ $C = 3.14(2)(3.8)$
3. 23.864 in. $C \approx \frac{8}{9}\cdot 3.14\times 24$ $P \approx 33.49+12+12 \approx 57.49$

CAT 3 M4S.

1. 7,610,526 $2\cdot 3^2\cdot 7\cdot 11\cdot 17^2 19$
2. 6 use divisibility rules for 4 and 3
3. 9.3 $.054\times(20\div 3)\times(55\div 6)$

CAT 4 ARITH

1. .63
2. 14%
3. $108.68 $190-(35\times 190)=123.50$; $123.50-(.15\times 123.50)$

CAT 5 ALG

1. −3, −1, 1, 3
2. 12:30 OR 12:30 p.m. but not 12:30 a.m.
3. 58 $42+48=90$ mph total $405\div 90=4.5$ hr $8+4.5=$

or Algebraically

$p+5p+25+20p+100+50p+300=2173$

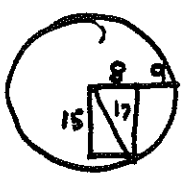
CAT 6 TEAM

1. A = 12 min
2. B = 8 yr.
3. C = 787.5
4. D = 3/5
5. E = 5040
6. F = 700

PYTHAGOREAN TH.

$1.1\times 1.1\sqrt{1.1}\ldots$ EIGHT TIMES → 2

3.



$A=\pi r^2-lw$

$A\approx 3.14(17^2)-8(15)$

4. 1,1,1,3 4 ways 1,2 2 ways

4/10 correct 6/10 incorrect

5. $1\cdot 7\cdot 6\cdot 5\cdot 4\cdot 3\cdot 2\cdot 1\cdot 1=5040$