2006 Pizitz Mathematics Tournament
Eighth Grade Ciphering

1-1 There are four cipherers on a team. In how many different orders can they cipher?

1-2 Simplify. $\dfrac{6}{5+\dfrac{4}{3+2}}$

1-3 A box measures ½ ft. by $^1/_6$ yd. by 8 in. Find its surface area in square inches.

1-4 Write as a simplified fraction. $\left(0.\overline{45}\right)\left(0.\overline{54}\right)$

1-5 What is the greatest integral solution for $3x + 10 < 1$?

2-1 Evaluate. $\dfrac{5!-4!}{(6-3)!}$

2-2 Write 231_4 in base 2.

2-3 Cuzak accurately predicted that 37 ½ % of 56 cipherers will answer a question correctly. What were the *odds* of answering correctly?

2-4 A cone has volume of 8π. If the radius is 2, what is its height?

2-5 Solve: $^3/_4(12x - 8) - 12 = {}^2/_3(6x + 3) + x$.

3-1 After a 7% tax, the total was $33.60. What was the price before the tax?

3-2 A spider climbed a wall. It traveled up 4 cm, left 9 cm, up 5 cm and then left 3 cm to reach the water spout. What is the distance from its starting point to the water spout?

3-3 Solve for x. $\dfrac{2x-1}{3x}=\dfrac{5}{8}$

3-4 Which digit is in the 63rd place to the right of the decimal point for $^3/_{7?}$

3-5 Simplify: $\dfrac{16^{3/4}+9^{1/2}}{3^{-2}}$.

4-1 Find the 23rd term in the following sequence: –12, –7, –2, . . .

4-2 A sphere has a diameter of 6. What is the difference between its surface area and volume, disregarding square and cubic units. Leave π in the answer.

4-3 Find the sum of the integral solutions for $-8 \le 3x + 2 < 8$.

4-4 Factor completely: $18x^2 - 2$.

4-5 Write in scientific notation. $\dfrac{(7.2\times10^3)(1.05\times10^5)}{(3\times10^2)(0.8\times10)}$

Ex1 Find the volume in cubic centimeters for a cube with an edge of 5 meters.

Ex2 If $f(x) = x^2 - 5$ and $g(x) = x - 5$, find $f(g(2)) + g(f(2))$.

Ex3 Wendy's bag has 5 blue pens, 4 red pens and 6 black pens. What is the probability that she blindly draws 2 red pens?

Answers

1-1 24

1-2 $^{30}/_{29}$

1-3 264 (sq. in.)

1-4 $^{30}/_{121}$

1-5 – 4

2-1 16

2-2 101101 or 101101_2

2-3 $^3/_5$ or 3:5

2-4 6

2-5 5, x=5, or {5}

3-1 $31.40

3-2 15 (cm)

3-3 8, x = 8 or {8}

3-4 8

3-5 99

4-1 98

4-2 0 or 0π

4-3 –5

4-4 2(3x+1)(3x-1) or 2(3x-1)(3x+1)

4-5 3.15×10^5

Ex1 125,000,000 (cm^3)

Ex2 –2

Ex3 $^2/_{35}$