

2005 Pizitz Mathematics Tournament
Eighth Grade Ciphery

- 1-1 Simplify: $(10 + 6 \cdot 8 - 8^2 + 9 - (-17))^3$
- 1-2 What is the sum of the median and mean of the first sixteen odd numbers?
- 1-3 Simplify and write in scientific notation: $\frac{(5.1 \times 10^{-3})(0.5 \times 10^{-1})}{(1.7 \times 10^4)}$.
- 1-4 Solve: $\frac{5}{y+2} = \frac{3}{y-2}$.
- 1-5 When $1/7$ is written as a decimal, which digit is 777 places to the right of the decimal point?
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- 2-1 Alex has a bag containing 5 blue marbles, 7 red marbles and 8 green marbles. What are the odds that he blindly draws a blue marble from the bag?
- 2-2 Factor completely: $91x^3y^5 - 52x^5y^4$.
- 2-3 Find the surface area of a cylinder with a radius of 7 in. and a height of 11 in. Leave pi in the answer.
- 2-4 If $f(x) = x^2 - 2$ and $g(x) = x + 5$, what is $g(f(g(3)))$?
- 2-5 Simplify: $\frac{(4 \cdot 9)^3}{2^3 \cdot 5^3 \cdot 6^3}$.
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- 3-1 In how many ways can the letters in ELEMENTS be arranged?
- 3-2 Simplify: $(\frac{1}{2})^2 + \frac{1}{2}^2 + (\frac{1}{2})^{-2}$.
- 3-3 $P \star Q = P^2 - Q^2$. Find $26 \star 23$.
- 3-4 If A is $12 \frac{1}{2} \%$ of 40, and B is 75% of 80, what is A% of B?
- 3-5 Joanna rode her bike from her house 3 miles south to the library, 10 miles east to school, 2 miles south to Zeng's house, and 2 miles east to the park. How far is she from home?
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- 4-1 What is the degree of the polynomial $2a^9b - 5a^4b^3 + 3a^7b^2$?
- 4-2 Find the y-intercept for a line parallel to the line $5x + y = 9$ and containing the point (3,4).
- 4-3 Carter can mow a lawn in 2 hours. Grant can mow the same lawn in 3 hours. Working together, how long would it take them to mow 4 lawns of the same size?
- 4-4 How many integers between -5 and 5 are in the solution set for $-4x + 9 < 22$?
- 4-5 $w = (v + 1)^2$ and $2v + 3 = 19$. Find $w^{1/4}$.

Extra

- Ex1. Simplify: $(4x^0y^4z^3)^4$.
- Ex2. A 5 ft. girl casts a shadow of 40 in. A nearby tree casts a shadow of 168 in. How many feet tall is the tree?
- Ex3. John earned the following test grades: 96, 83, 94, and 88. What must he make on the next test to have an average of 91?

Answers	
1-1	8000
1-2	32
1-3	1.5×10^{-8}
1-4	8, y = 8 or {8}
1-5	2
2-1	1/3, 1:3 or 1 to 3
2-2	$13x^3y^4(7y-4x^2)$
2-3	252π or 252π sq. in.
2-4	67
2-5	$27/125$ or 0.213
3-1	6720
3-2	$19/4$, $4 \frac{3}{4}$, or 4.75
3-3	147
3-4	3
3-5	13 or 13 miles
4-1	10
4-2	19
4-3	$24/5$, $4 \frac{4}{5}$ or 4.8 hr.
4-4	8
4-5	3
Ex1	$256y^{16}z^{12}$
Ex2	21, 21' or 21 ft.
Ex3	94