# 2003 Washington State Math Championship

Unless a particular problem directs otherwise, give an exact answer or one rounded to the nearest thousandth.
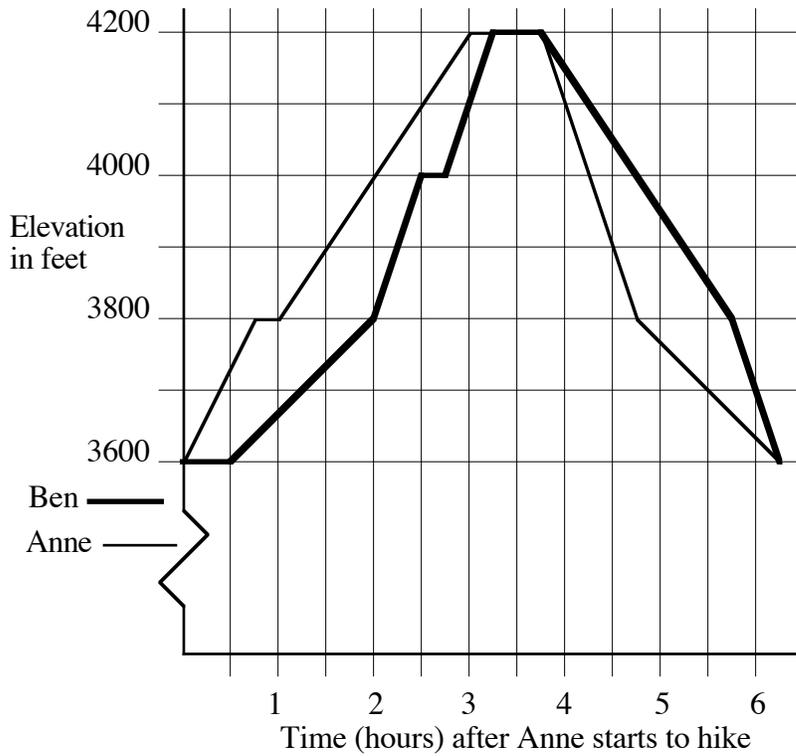
Algebra - Grade 5

1. Give the reduced fraction equivalent to $\dfrac{6x + 18y}{9x + 27y}$ if $x = 20$ and $y = 3$.

2. The library charges a fine for overdue books. The fine is $0.25 per book for the first day, $0.05 per book per day for the rest of the days in the first week, and $0.10 per book per day after that. Owen Bucks paid a fine of $4.05 for 3 books that were checked out and returned together. How many days were the books overdue?

3. 5 CDs cost as much as 3 DVDs. One CD and one DVD together cost $38.80. How much does one DVD cost?

4. What is the sum of the reciprocals of the first 5 positive integers? (Express the answer as a reduced mixed number.)

5. The amount of interest is (always) proportional to the interest rate. If an account generates $24 when the interest rate is 3.2%, how much will it generate when the interest rate is 3.8%?
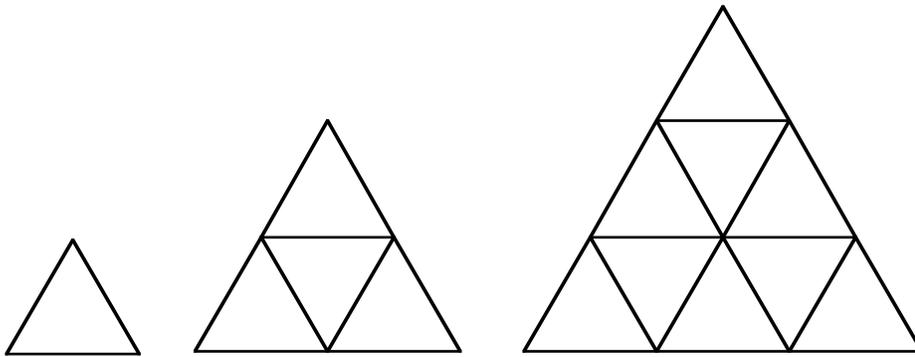
6.

The first 3 figures of a sequence are shown. How many small triangles are in the first 10 figures?

7. 2003 is a prime number. What is the next year after 2003 that will be prime?

8. If $3M - N^3 = 2003$ and $M - N^3 = 1$, what is the sum of the prime factors of M?

9. Ben Thayer and Anne Back each hike to the top of a mountain and back by the same route. Anne rests once on her way to the top. How long is it from the time that she leaves this resting point until Ben arrives there?

Elevation in feet

4200

4000

3800

3600

Ben ———
Anne ———

1   2   3   4   5   6
Time (hours) after Anne starts to hike

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10. Ben Thayer and Anne Back each hike to the top of a mountain and back by the same route. At one time in their hike Anne is changing her elevation twice as fast as Ben. At another time in their hike Ben is changing his elevation 3 times as fast as Anne. How long is it from the beginning of one of these times to the beginning of the other?