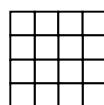


# 2004 Washington State Math Championship

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

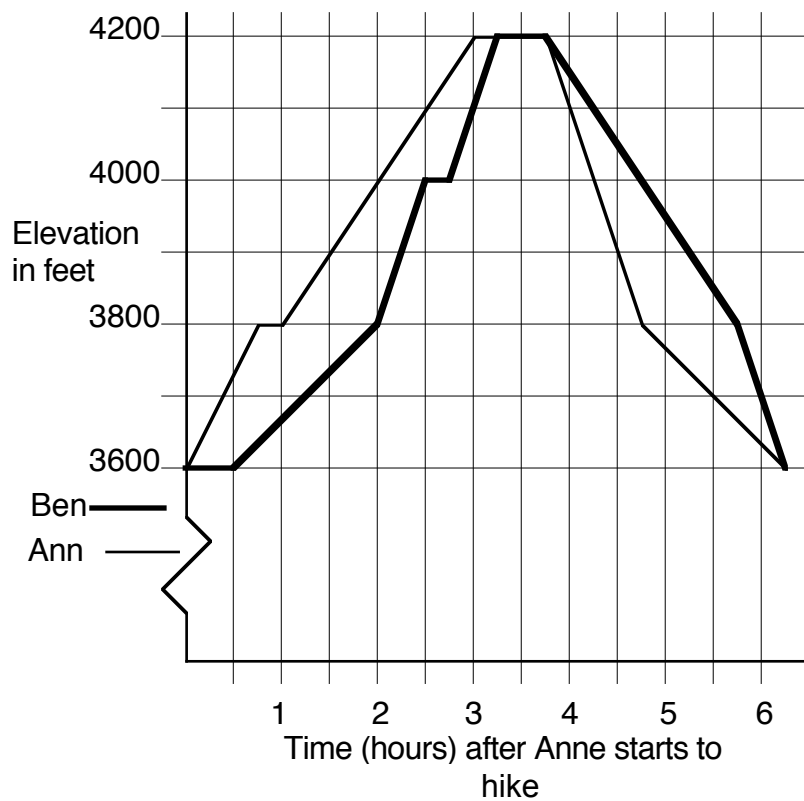
## Algebra - Grade 5

1. It takes a swimmer 30 lengths to complete a 1500-meter race in an Olympic-sized swimming pool. How long is the pool in feet, if 1 inch equals 2.54 centimeters? (Write your answer to the nearest foot.)
2. A piece of rope 27 meters long is cut into two pieces so that one piece is four-fifths as long as the other. Find the length of the longer piece.
3. The average of three numbers is 55. The second is 1 more than twice the first, and the third is 4 less than three times the first. Find the largest number.
4. If each side of each square were 2 matches long, how many matches would the 10<sup>th</sup> figure contain?



5. If  $3\heartsuit 8 = 42$ ,  $6\heartsuit 7 = 24$ , and  $5\heartsuit 3 = 51$ , what would be the value of  $\frac{9\heartsuit 3 + 3\heartsuit 9}{3\heartsuit 7}$ ?
6. The numerator of a fraction is 12 more than the denominator. The sum of the numerator and the denominator is 5 more than three times the denominator. What is the reciprocal of the fraction?
7. On the planet Newtron for money they use zwangs, dools, paks and carks. If 1 zwang is 5 dools, 1 dool is 9 paks, 3 paks is 6 carks, how many carks can a person get for 1 zwang?
8. What is the sum of the reciprocals of the first 5 positive prime intervals? (Express your answer as a reduced mixed number.)
9.  $2b$  or not  $2b$ : if  $\frac{a+b}{c(e-d)} = \frac{b(f+g)}{hj}$ , what is  $b$ 's opposite?

$$a = 3\frac{2}{3} \quad c = -2 \quad d = 5 \quad e = 4 \quad f = \frac{3}{4} \quad g = a \quad h = 1 \quad j = 3^2$$



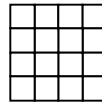
10. Ben Thayer and Anne Back each hike to the top of a mountain and back by the same route. How much faster is the fastest hiker at his/her fastest speed than the slowest speed gone by the slowest hiker? Give your answer in feet per hour.

# 2004 Washington State Math Championship

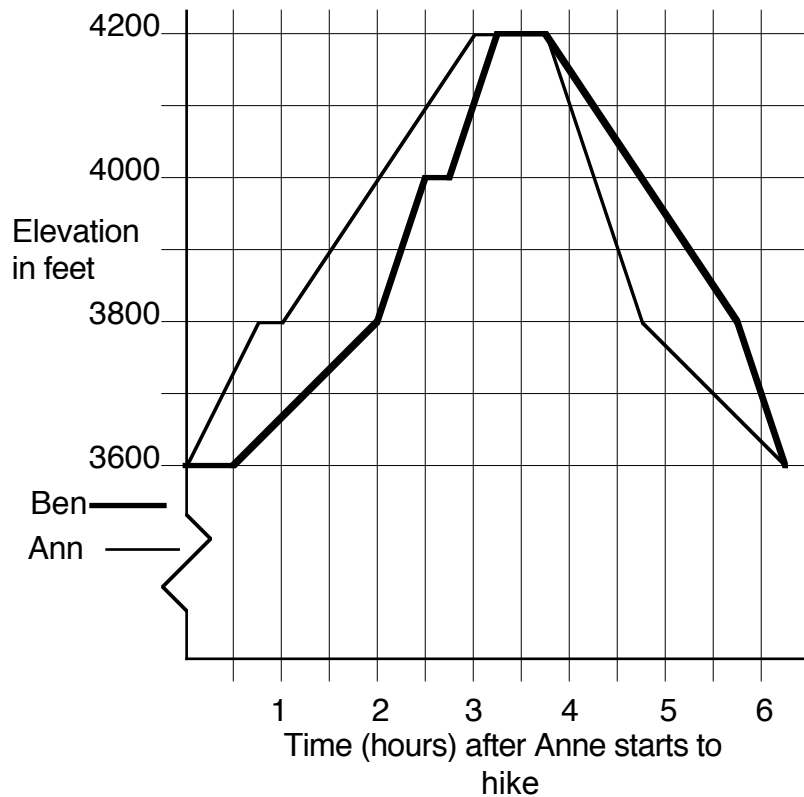
Unless a particular problem directs otherwise, give an exact answer or one rounded to the nearest thousandth.

## Algebra - Grade 6

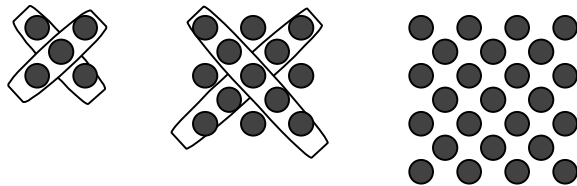
1. If each side of each square were 2 matches long, how many matches would the 10<sup>th</sup> figure contain?



2. If  $3♥8 = 42$ ,  $6♥7 = 24$ , and  $5♥3 = 51$ , what would be the value of  $\frac{9♥3 + 3♥9}{3♥7}$
3. The numerator of a fraction is 12 more than the denominator. The sum of the numerator and the denominator is 5 more than three times the denominator. What is the reciprocal of the fraction?
4. On the planet Newtron for money they use zwangs, dools, paks and carks. If 1 zwang is 5 dools, 1 dool is 9 paks, 3 paks is 6 carks, how many carks can a person get for 1 zwang?
5. What is the sum of the reciprocals of the first 5 positive prime intervals? (Express your answer as a reduced mixed number.)
6.  $2b$  or not  $2b$ : if  $\frac{a+b}{c(e-d)} = \frac{b(f+g)}{hj}$ , what is  $b$ 's opposite?
- $a = 3\frac{2}{3}$      $c = -2$      $d = 5$      $e = 4$      $f = \frac{3}{4}$      $g = a$      $h = 1$      $j = 3^2$
7. After a celebrity owns a car, its value increases yearly by 3.2%. However, usually any other car loses its value by 8.3% each year. If a \$32,582 car had been driven by celebrity Ima Starr versus non-celebrity Noah Bodey what would be the difference in the car's value after 4 years? (Round all values to the nearest cent.)



8. Ben Thayer and Anne Back each hike to the top of a mountain and back by the same route. How much faster is the fastest hiker at his/her fastest speed than the slowest speed gone by the slowest hiker? Give your answer in feet per hour.
9. How many dots will be in the longest diagonals of the 12<sup>th</sup> design? (The longest diagonals have been specified for you on the first two.)



10. Greeney Thumb noticed the weeds in her garden were growing rapidly. She checked on Sunday that there were 23 weeds. Wednesday she noticed that they were growing at a rate of 25% per day, but she didn't have a chance to weed until Saturday evening. How many weeds did she have to pull on Saturday evening? (Round your answer to the nearest weed.)

# 2004 Washington State Math Championship

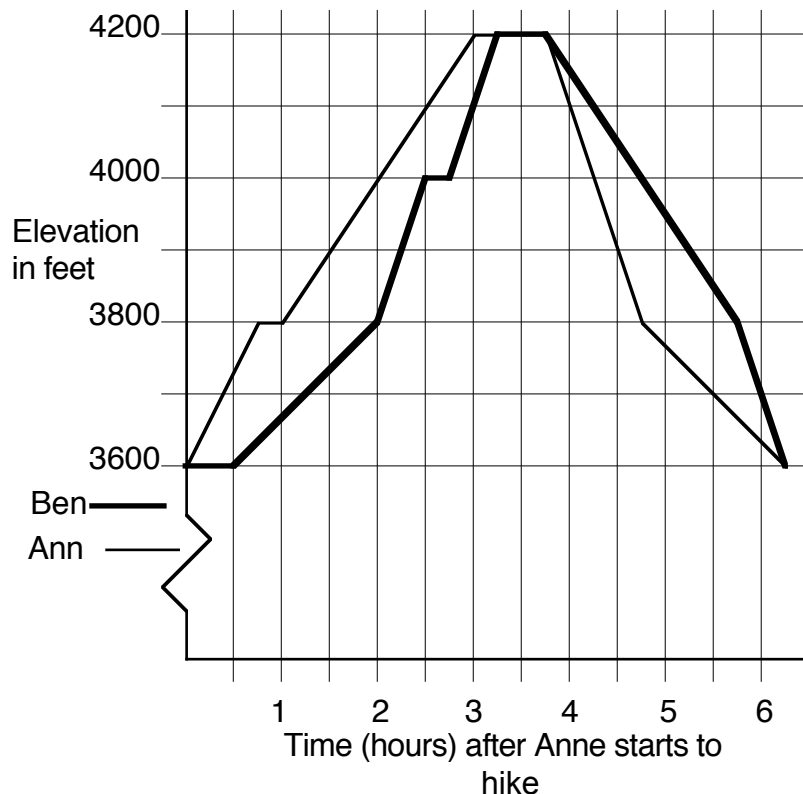
Unless a particular problem directs otherwise, give an exact answer or one rounded to the nearest thousandth.

## Algebra - Grade 7

1. On the planet Newtron for money they use zwangs, dools, paks and carks. If 1 zwang is 5 dools, 1 dool is 9 paks, 3 paks is 6 carks, how many carks can a person get for 1 zwang?
2. What is the sum of the reciprocals of the first 5 positive prime intervals? (Express your answer as a reduced mixed number.)

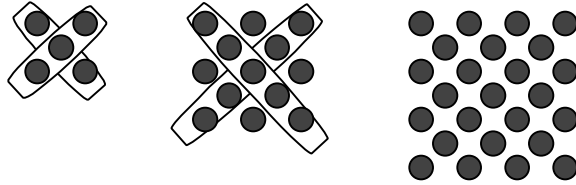
3.  $2b$  or not  $2b$ : if  $\frac{a+b}{c(e-d)} = \frac{b(f+g)}{hj}$ , what is  $b$ 's opposite?

$$a = 3\frac{2}{3} \quad c = -2 \quad d = 5 \quad e = 4 \quad f = \frac{3}{4} \quad g = a \quad h = 1 \quad j = 3^2$$



4. Ben Thayer and Anne Back each hike to the top of a mountain and back by the same route. How much faster is the fastest hiker at his/her fastest speed than the slowest speed gone by the slowest hiker? Give your answer in feet per hour.

5. After a celebrity owns a car, its value increases yearly by 3.2%. However, usually any other car loses its value by 8.3% each year. If a \$32,582 car had been driven by celebrity Ima Starr versus non-celebrity Noah Bodey what would be the difference in the car's value after 4 years? (Round all values to the nearest cent.)
6. How many dots will be in the longest diagonals of the 12<sup>th</sup> design? (The longest diagonals have been specified for you on the first two.)

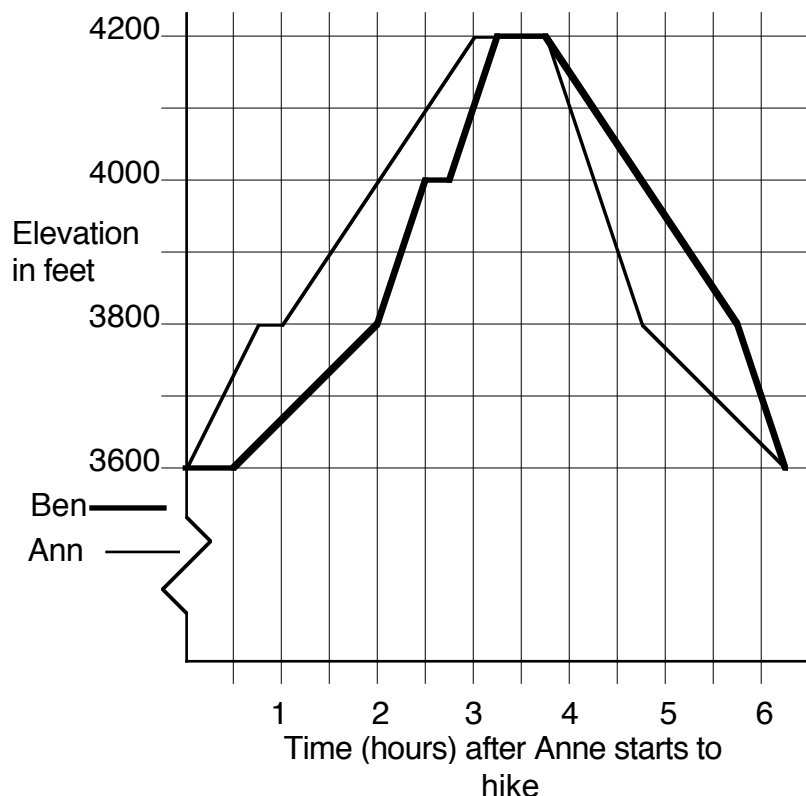


7. Greeney Thumb noticed the weeds in her garden were growing rapidly. She checked on Sunday that there were 23 weeds. Wednesday she noticed that they were growing at a rate of 25% per day, but she didn't have a chance to weed until Saturday evening. How many weeds did she have to pull on Saturday evening? (Round your answer to the nearest weed.)
8. A work crew of four people requires five hours and fifty minutes to do paint an entire house. How many minutes will it take a crew of 8 to complete the job if everyone is working at the same rate?
9. The height of a bridge cable above the road is directly proportional to the square of the distance from the center of the bridge. Fifty feet from the center of the bridge the cable is 12.5 feet above the road. How far above the road is the cable if you are 75 feet from the center of the bridge?
10. If James makes a round trip to a town 32 miles away and returns all in one hour, what is his average speed in feet per second? Round your answer to the nearest hundredth foot. (1 mile = 5280 feet)

# 2004 Washington State Math Championship

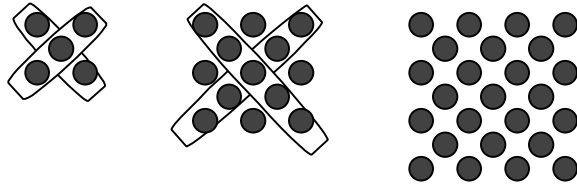
Unless a particular problem directs otherwise, give an exact answer or one rounded to the nearest thousandth.

## Algebra - Grade 8



1. Ben Thayer and Anne Back each hike to the top of a mountain and back by the same route. How much faster is the fastest hiker at his/her fastest speed than the slowest speed gone by the slowest hiker? Give your answer in feet per hour.
2. After a celebrity owns a car, its value increases yearly by 3.2%. However, usually any other car loses its value by 8.3% each year. If a \$32,582 car had been driven by celebrity Ima Starr versus non-celebrity Noah Bodey what would be the difference in the car's value after 4 years? (Round all values to the nearest cent.)

3. How many dots will be in the longest diagonals of the 12<sup>th</sup> design? (The longest diagonals have been specified for you on the first two.)



4. Greeney Thumb noticed the weeds in her garden were growing rapidly. She checked on Sunday that there were 23 weeds. Wednesday she noticed that they were growing at a rate of 25% per day, but she didn't have a chance to weed until Saturday evening. How many weeds did she have to pull on Saturday evening? (Round your answer to the nearest weed.)
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7. If James makes a round trip to a town 32 miles away and returns all in one hour, what is his average speed in feet per second? Round your answer to the nearest hundredth foot. (1 mile = 5280 feet)
8. The sum of two numbers is -42. The first number minus the second is 52. What is the lesser number?
9. The value of a copying machine can be modeled exponentially. Its value when purchased is \$5200. After 2 years, its value is \$4225. Find its value after 8 years. (Round your answer to the nearest dollar.)
10. How many times will the digit 3 be used when writing the positive integers less than nine hundred?