

Idita-Math Competition

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Des Moines, Iowa

Created for 6th Grade Math Class

1. Some Iditarod mushers feed their dogs a snack called a honey ball. Honey balls are made of $\frac{3}{4}$ of a cup of honey: $1\frac{1}{2}$ cups of ground beef, and $\frac{1}{4}$ cup of vitamins and minerals.

What is the overall size of a honey ball with all these ingredients added together?

2. Write a 4 digit number that is divisible by 4.

3. How many meters in a kilometer?

4. Write the decimal fourteen and six hundred twenty-one thousandths.

5. Iditarod mushers must carry in there sleds 8 booties for every dog on their team, plus the 8 that they have on their feet at the time. If a musher has 16 dogs at the start of the race, how many booties will they need to leave Anchorage with?

1. The latitude of Anchorage is 61.12 degrees north. The latitude of Nome is 64.30 degrees north. From start to finish how far north do they travel?

2. Write a 3 digit number that is divisible by 9

3. How many quarts in a gallon?

4. Name the next term in the sequence: 40, 20, 10, 5, ____

5. 1st place in the 2007 Iditarod paid 69,000, while 30th pays \$1049. What is the difference?
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1. Many mushers carry with them Gatorades to help them stay hydrated. What if every musher in the race carried 5 Gatorades with them per day, how many Gatorades would they need to purchase? (Let's say that there are 100 mushers at the start of the race and they race for 10 days.)
2. Name a number that is greater than -5.
3. What is the probability of flipping heads on a coin
4. What is the GCF of 24 and 25?
5. Mushers during the 1925 Serum Run traveled 674 miles to save the children of Nome. The Iditarod sled dog race will cover 1112 miles this year, how much longer is the race compared to the serum run?

1. A musher trains 8 dogs per day. A training run usually covers about 15 miles per day. If a musher trains 7 days per week, how many miles will the team travel per week?
2. If you have three shirts to pick from, four pairs of pants, and two pairs of shoes, how many different combinations (outfits) can you make?
3. What is the LCM of 7 and 12?
4. How many centimeters in a decameter?
5. Each musher must pay an entry fee of \$3000 to run the Iditarod. There are 96 mushers entered to run the 2008 Iditarod, how much money will be collected in entry fees for this year's Iditarod?

You are a musher in this year's Iditarod race. Prepare a strategy for your race.

- 1) Decide which checkpoints are going to be the toughest based on things like terrain, elevations, length, possible weather and temperatures. (Place all 15 checkpoints in order with the most difficult checkpoint first and the easiest checkpoint last.)
- 2) Decide where you will have to rest your dog sled team the most.
- 3) Decide where you might be able to make up time on your competitors and really push the dog team (Where will you be able to really let them loose and run the fastest?)

Go to the Iditarod website (www.iditarod.com) and find the link called _____ on the right side of the site. Find your musher and answer the following questions:

- 1) How fast did your musher complete the last checkpoint? Please include hours and minutes, the length of the trail, and the speed they traveled during that run of the race. (Make sure you include what checkpoint he/she just completed.)
- 2) If your musher travels at this speed again during the next run, how long will it take them to get to the next check point?
- 3) If your musher completes the rest of the race at this speed, how long will it take your musher to complete this year's Iditarod?
- 4) What is wrong with this thinking?
Why can't we predict the winning time of this year's Iditarod using mathematics like this?

You are a musher in this year's 2009 Iditarod. Answer the following questions to make your way from Anchorage to Nome. Each question will move you along the trail. You will have three weeks to work on this project, so if you get stuck with a question come see me and we can work through it. Now, let's begin your race!

The race begins pretty easy...good snow, nice weather, smooth trail. But then, you enter one of the most dangerous sections of the Iditarod Trail. Many mushers have had their hopes and dreams crushed in this section of the race. This part of the race is called "The Steps," and many mushers call it one of the two most dangerous and treacherous areas in the Iditarod. The Steps are a series of three almost-vertical drops through very tight ravines. The Steps can be found about 170 miles from Anchorage. Place a mark on the map where we can find The Steps.

The second most dangerous section on the Iditarod trail is known as the Dalzell Gorge, and you are rapidly approaching it! Like the Steps, the Gorge has been known to smash competitors, end their race, and even on occasion, send mushers to the emergency room! The Dalzell Gorge is 230 miles into the race. Place on the map where you will find the Dalzell Gorge.

If you think you have made it through the tough stretch of the Iditarod and maybe relax a little, you couldn't be more wrong! Mt. McKinley hits you right in the face with constant 40 mph winds, freezing temperatures, and blowing snow. At this point, you have only completed about 30% of the race, but if you can make it through this, you can survive anything. Place a mark on the trail where Mt. McKinley can be found.

You have now completed over 3/8 of the race. But, you have another major obstacle at this point in the race. You must cross the Kuskokwim River. This can be a scary and tricky endeavor. Only the most skilled musher will make it across quickly and safely. Mark on your map where the Kuskokwim River will be on the Iditarod map.

At the checkpoint of Ophir, you realize that sled repairs are necessary for you to complete your goal of finishing the Iditarod or possibly even winning this year's race. You must replace the runners on your sled, fix a broken brake, and mend a cracked handle that you suffered earlier in the Gorge. If you rest in Ophir for a bit, what percent of the race have you now completed?

Each year, one musher is awarded with the Dorothy Page Halfway Award. This award is given to the first musher to complete the first half of the race. The winner of this race is awarded with \$3000 in gold nuggets. Determine which checkpoint is associated with the Dorothy Page Halfway Award. (Extra Credit: Who is Dorothy Page?)

Most mushers wait to take their 24 hour mandatory stop once they have completed at least half of the race. This time is used to re-energize the mushers, and most importantly, the dogs. This year, you have decided to run 3/5 of the race before taking your mandatory 24 hour layover. Place a mark on the trail where you will be resting.

Now that you and your dogs are well rested, you are ready to attack some of the more difficult sections of the Iditarod Trail. Your next challenge will be the crossing of the Little Yentna and Big Yentna, two smaller river systems that cause many problems due to open water and overflows on the trail. These two river systems are close to the Shageluk checkpoint. When you arrive in Shageluk, how many total miles have you completed of the 1131 miles? What percent of the race does that represent?

Your next dangerous challenge on this part of the trail will arrive when you reach the Yukon. This challenge will begin when you reach the destination of Anvik. If you are the first to reach this checkpoint, you will win Millennium Hotel's First Musher to the Yukon. This award is accompanied with a 7 course meal and \$3500. How many miles do you have left in this year's Iditarod? What percent does that represent?

After one of the longest runs in the Iditarod, you decide to use one of your two 8 hour mandatory rest stops. These rests are great times to assess your team, compare your team to your other competitors, analyze your race strategy, possibly create a new plan of attack for finishing the race, feed the dogs, and once that is all done....get a little rest for your self! Your plan said to take this stop after you have completed $\frac{2}{3}$ (66%) of your race. Place a mark on the map next to the checkpoint that will be the closest to this goal.

Some of the most brutal weather that you will face in this year's Iditarod will be along the Bering Sea Coast. This section of the race begins at mile marker 862 at the checkpoint of Unalakleet. How many more miles do you have left?

The hard, ice-packed trails on the Bering Sea Coast can be tough on the sled. You sustained considerable runner damage that needed to be fixed. But, before you could pull over to fix your sled, the gangline snapped and your dogs got a way from you for a while. You decide to use this time to regroup and rest yourself and the team. You figure you have now completed about 80% of the race. Place a mark on your map to show where you are currently resting now.

The winds along the Bering Sea coast can be brutal and bring deadly blizzard conditions. You have run into one of these race-changing storms and decide to use your last 8 hour stop. You have now completed $\frac{9}{10}$ of the race. What checkpoint will you be closest to? How many miles have you completed? Place a mark on the map where you will be stopping.

Trail conditions deteriorate with high winds and blowing snow at the White Mountain checkpoint. Because of the harsh conditions on the trail, you decide to stop overnight to feed and rest your dogs and change booties. How many miles have you completed? What percent of the trail have you now completed?

Pick two of the following problems to solve to earn your stamp on the Iditarod Trail.

1. By the Iditarod rules, all mushers must carry with them at all times one pair of snow shoes. Each shoe must be at least 252 square inches in size. Draw a shoe that would meet these requirements. Your picture should be the actual size that a real shoe would be.

2. Find the mean, median and mode of the distances between all the checkpoints in this year's Iditarod. You can find all the distances of the checkpoints on www.iditarod.com. Click on the tab on the right side that says "Route and checkpoints" to find the necessary information.

3. During the odd years, the ITC uses the southern route of the Iditarod Trail. The run between Ophir and Iditarod is one of the longest sections of the trail. It is 90.2 miles. Iditarod to Shageluk is only 65.1 miles. Shageluk to Anvik and Anvik to Grayling are both short routes and mushers must cover only about 20 miles each. Grayling to Eagle River covers about 60.5 miles. The last leg of the southern trail is Eagle River to Kaltag, which measures around 69.8 miles. What is the total distance of the southern trail? What is the average distance for these 6 sections of the route? You may **not** use a calculator for this problem...all work must be shown!

4. Iditarod rules say that a musher must have with them at all times the following items: a sleeping bag weighing at least 5 pounds, an ax with a head that weighs at least $1\frac{3}{4}$ pounds, a pair of snowshoes, 8 dog booties for every dog on your sled team, 3 gallons of water, a cooker/pot for cooking and melting water, and a veterinarian book to update the health of all their dogs. Determine the weight of the following items in every musher's sled.

Sleeping bag: 5.1 lbs.

Ax: $1\frac{3}{4}$ lbs.

Snowshoes: 4.25 lbs.

4 extra booties per dog: 0.02 of a pound per bootie (Remember, you have 16 dogs!)

3 gallons of water: 8.35 lbs. per gallon

Cooker/Pot: 7.8 lbs.

Vet notebook: $\frac{1}{2}$ lb.

5. Go to the Iditarod website at www.iditarod.com and click on the tab on the top of the page that says "2009 Iditarod." Then, find the tab on the right-hand side of the page that reads "StormReady Weather Center." Record the high temperature for each section of the trail in the chart below for five consecutive days. There is also a place in the chart to record the high temperature for that day in Des Moines, Iowa. Make a 10-line line graph to display your results.

By Iditarod rules, all dogs must wear booties to protect their paws. How many total booties will a musher need if they change booties every 50 miles or at each checkpoint, whatever comes first?

Lance Mackey has a $9\frac{1}{2}$ mile lead over Jeff King. How long will it take King to catch Mackey if Mackey is traveling at 4.5 mph and King is traveling at 6.1 mph?

Martin Buser and his two sons, Nikolai and Rohn, train their dog sled teams on a regular schedule. Martin trains his team of dogs every other day. Rohn likes to train his team every third day. Nikolai only likes to run his team once per week (every 7 days). If they sometimes use the same dogs, which day will they all want to use the same dogs?

Go to www.iditarod.com and click on the tab that reads "Learn About" tab on the top of the page. Then, click on the tab on the right that says "The Iditarod Trail." Find three checkpoints that would form an acute angle. Then, find three checkpoints that form an obtuse angle. A right angle? A straight angle?

The official length of the Iditarod is 1049 miles. If you have completed $\frac{1}{4}$ of the race, how many miles have you completed? If you have finished $\frac{1}{2}$ of the race, how many miles are behind you? $\frac{3}{4}$? $\frac{5}{6}$?

Leonhard Seppala and his team of dogs completed 250 miles of the 674 miles of the serum run of 1925. What fraction of the run did he do himself? What percent would does that represent? Using an Iowa map, name a city on I-80 or I-35 that represents this distance.

Before each Iditarod, mushers must Make sure they have properly equipped their dogs. Most mushers will not leave Anchorage unless they have a jacket for each dog, a blanket for each dog, 8 booties for each dog, and flashing collars for each dog. Northern Outfitters sells their dog blankets for \$49.99. Prairie Snowstorm produces a dog jacket for \$44.99. 3M makes a durable dog bootie for \$1.25 (per booties). UFlash offers illuminated dog collars for \$9.99. If a musher starts with 16 dogs, how much will he or she spend to ensure their dogs are safe?

By Iditarod rules, all dogs must wear booties to protect their paws. Mushers must decide what brand of booties they want to purchase before they begin the race. Cordura brand booties cost only \$0.95, but last only 50 miles. Spandura brand booties cost a little More at \$1.15, but can last up to 75 miles. Toughtek 9000s cost a whopping \$3.75, but a dog team can go 200 miles on one pair! If the Iditarod is 1049 miles, which bootie is the most economical choice?

In last year's Iditarod Lance Mackey left Yentna at 5:45 pm and arrived in Skwentna at 9:00 pm that same evening. If the distance between those two checkpoints is 34 miles, how fast was he traveling? Mackey then left Skwentna at midnight and later arrived to Finger Lake at 3:30am. If it is 45 miles, how fast did he run? It is 30 miles between Finger Lake and Rainy Pass. If Mackey travels at 3.6 mph between How long will it take him to complete this stretch of the race. If he leaves at 9:00 am, what time will he arrive in Rainy Pass?