

## Algebra Essentials and Applications Internet Activity

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### ME1 Marathon Investigations

1. Tuna Canyon Road in Santa Monica, California, is a favorite with local bicyclists. It climbs 2410 feet over a distance of 7.5 miles. What is the gradient? Round your answer to the nearest tenth of a percent.
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2. Sonora Pass in California has an 18% gradient in some sections. What would be the equivalent slope? Write your answer as a fraction in simplest form.
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3. A section of San Francisco's Filbert Street has a gradient of 0.32. This is one of the steepest gradients for any city street in the United States. What is the change in altitude (in feet) if you travel 0.1 mile horizontally on this section? Round your answer to the nearest foot.
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4. Perhaps the most famous feature of the Boston Marathon is "Heartbreak Hill." While not the steepest part of the marathon, it is one of the last challenges in a long and grueling course. With the finish line in sight, many runners surrender to their fatigue.

"Heartbreak Hill" lies on a one-mile stretch where the elevation rises from 150 feet to 230 feet. Find the gradient of "Heartbreak Hill." Round your answer to the nearest tenth of a percent.

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5. What is the change in elevation from mile mark 15.0 to 16.0?
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6. What is the gradient for this section of the course? Round your answer to the nearest tenth of a percent.
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7. On which one-mile section does the greatest change in altitude occur? What is the change in elevation on that part of the course? What is the gradient on this section? Round your answer to the nearest tenth of a percent.
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