

# Rates of Change – Answer Key

1. Consider a girl at the 50th percentile. Estimate the rate of change in her height (inches per year) at the following ages.

AGE	3	5	7	9	11	13	15	17
RATE OF CHANGE IN HEIGHT (INCHES PER YEAR)	3.0	3.0	2.5	2.0	2.5	1.0	0.5	0.4

*The values in this chart were found by taking the height at the desired age and the height at a half-year beyond the desired age, and calculating the slope between those two points.*

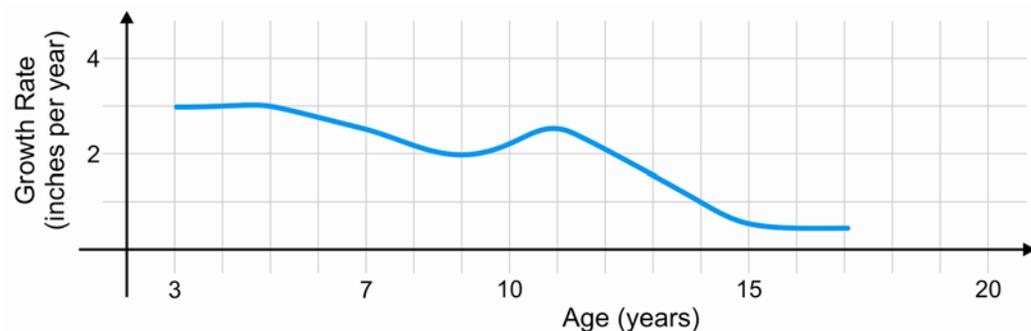
2. For a girl at the 50th percentile, at what age is her rate of change in height the greatest? That is, when is she growing the fastest? Estimate her rate of change in height (inches per year) at this age.

*Around 3 years old.*

3. As a girl at the 50th percentile gets close to 20 years of age, explain what happens to her rate of change in height. Use the graph of Height vs. Age to justify your answer.

*The growth rate approaches zero, as she stops growing.*

4. Use your results from Question 1 to sketch a graph representing the approximate **rate of change in height** vs. the age for a girl at the 50th percentile from age 3 to 20. What happens to a girl's rate of change in height over time? Explain.



5. Consider a boy at the 50th percentile. Estimate the rate of change in his height (inches per year) at the following ages.

AGE	3	5	7	9	11	13	15	17
RATE OF CHANGE IN HEIGHT (INCHES PER YEAR)	3.0	2.5	2.5	2.0	2.5	3.0	1.5	0.5

*The values in this chart were found by taking the height at the desired age and the height at a half-year beyond the desired age, and calculating the slope between those two points.*

6. For a boy at the 50th percentile, at what age is his rate of change in height the greatest? That is, when is he growing the fastest? Estimate his rate of change in height (inches per year) at this age.

*Around 3 years of age, and then again at 13.*

7. As a boy at the 50th percentile gets close to 20 years of age, explain what happens to his rate of change in height. Use the graph of Height vs. Age to justify your answer.

*The growth rate approaches zero, as he stops growing.*

8. Use your results from Question 5 to sketch a graph representing the approximate **rate of change in height** vs. the age for a boy at the 50th percentile from age 3 to 20. What happens to a boy's rate of change in height rate over time? Explain.

