

## MAT.08.ER.2.000SP.D.150 Claim 2

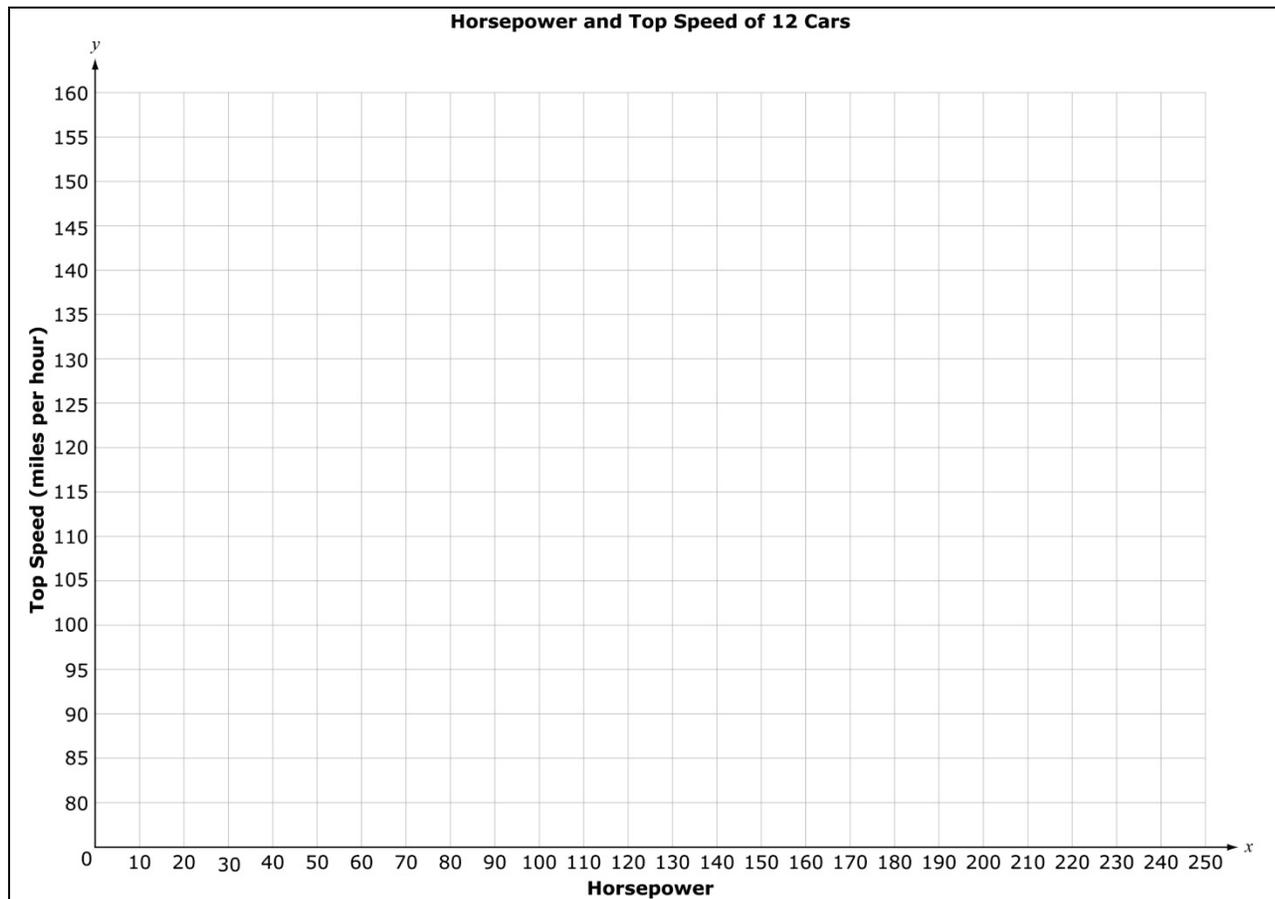
Sample Item ID:	MAT.08.ER.2.000SP.D.150
Grade:	08
Primary Claim:	<b>Claim 2: Problem Solving</b> Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem solving strategies.
Secondary Claim(s):	Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.  Claim 3: Communicating Reasoning Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.
Primary Content Domain:	Statistics and Probability
Secondary Content Domain(s):	
Assessment Target(s):	2 D: Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas).  1 J: Investigate patterns of association in bivariate data.  2 A: Apply mathematics to solve well-posed problems arising in everyday life, society, and the workplace.  2 B: Select and use appropriate tools strategically.  2 C: Interpret results in the context of a situation.  3 F: Base arguments on concrete referents such as objects, drawings, diagrams, and actions.
Standard(s):	8.SP.3
Practice(s):	1, 2, 3, 4, 5, 6
DOK:	3
Item Type:	ER
Score Points:	6
Difficulty:	M
Key:	See Sample Top-Score Response.
Stimulus/Source:	<a href="http://lib.stat.cmu.edu/DASL/Datafiles/carmpgdat.html">http://lib.stat.cmu.edu/DASL/Datafiles/carmpgdat.html</a> This kind of information may be public domain. I do not think we would need a copyright for it.
Target-specific attributes (e.g., accessibility issues):	Calculators may be used for this item.
Notes:	Part of PT set.

This table shows the horsepower and top speed of 12 cars.

Horsepower	Top Speed (miles per hour)
165	122
150	117
90	109
49	96
70	105
62	98
245	148
140	114
103	112
180	133
130	115
145	120

**Part A**

Construct a scatter plot of the data in the table on the graph below.

**Part B**

Draw a line of best fit on the graph for the data points graphed.

**Part C**

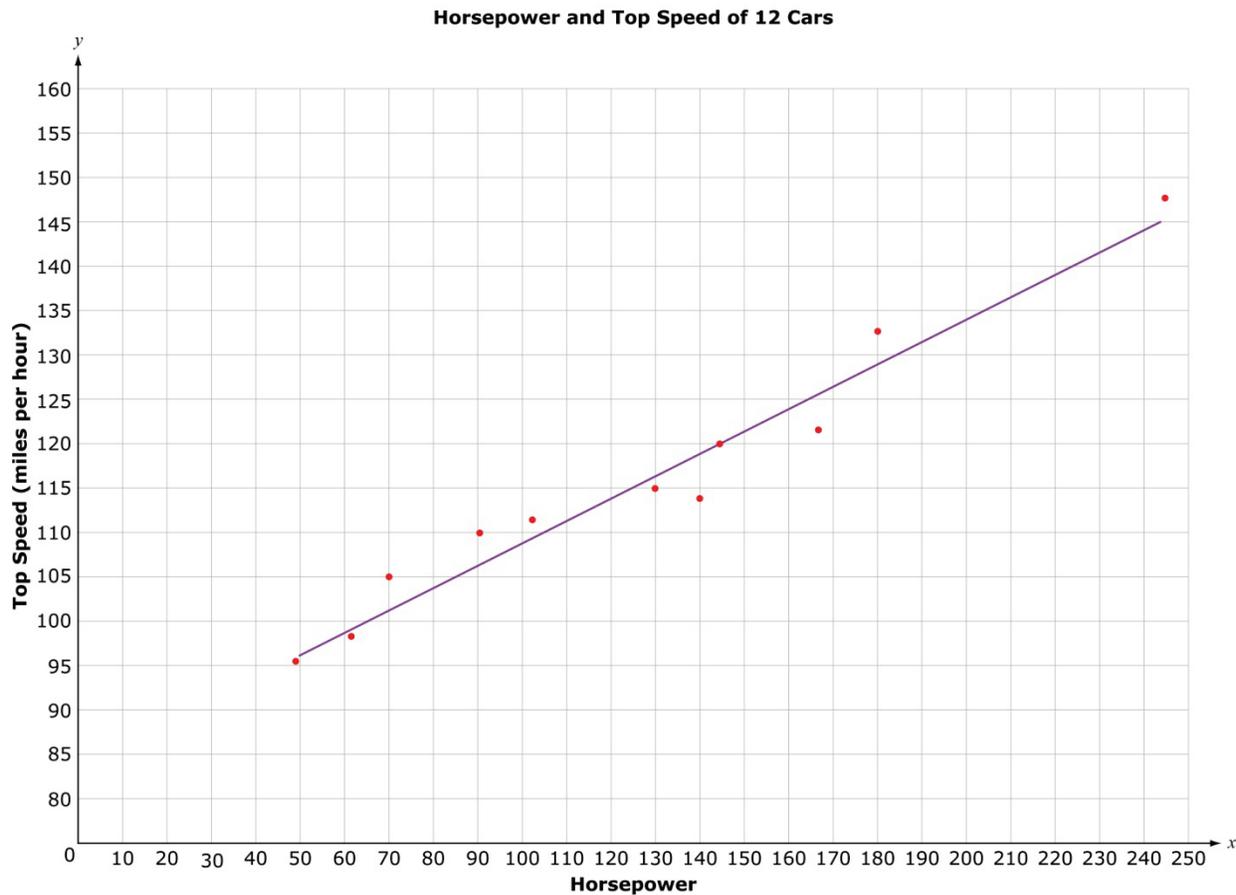
Based on the graph you drew, how much more horsepower is needed to increase the top speed of a car by 5 miles per hour?

more horsepower

Explain how you found your answer.

*Sample Top-Score Response:*

*Part A and Part B:*



*Part C:*

20 more horsepower. The slope of the line is about 10 miles per hour for 40 horsepower so it takes about 20 more horsepower for the top speed of the car to increase by 5 miles per hour.

*Scoring Rubric:*

The item will score 0-6 points, based on up to 2 points available in each part:

*Part A:*

**2 points:** The student shows a thorough understanding of how to construct a scatter plot. The student plots each point very closely to where it should be located on the graph.

**1 point:** The student shows a partial understanding of how to construct a scatter plot. The

student makes minor errors when plotting individual points.

**0 points:** The student shows inconsistent or no understanding of how to construct a scatter plot. The student makes major errors when plotting individual points, such as reversing  $x$ - and  $y$ -values.

*Part B:*

**2 points:** The student shows a thorough understanding of how to construct a line of best fit. The line of best fit is within a preset range.

**1 point:** The student shows a partial understanding of how to construct a line of best fit. The line is constructed so that parts of the line are outside of the preset range.

**0 points:** The student shows inconsistent or no understanding of how to construct a line of best fit.

*Part C:*

**2 points:** The student shows a thorough understanding of how to interpret the slope of a line of best fit. The answer of 20 and the explanation are both complete and correct.

**1 point:** The student shows a partial understanding of how to interpret the slope of a line of best fit. Minor errors may be made in calculating the slope, or minor errors may be made in interpreting the slope.

**0 points:** The student shows inconsistent or no understanding of how to interpret the slope of a line of best fit.