

NAME: \_\_\_\_\_

1. 010933b, P.I. A2.S.7

The accompanying table shows wind speed and the corresponding wind chill factor when the air temperature is  $10^{\circ}\text{F}$ .

Wind Speed (mi/h) $x$	Wind Chill Factor ( $^{\circ}\text{F}$ ) $y$
4	3
5	1
12	-5
16	-7
22	-10
31	-12

Write the logarithmic regression equation for this set of data, rounding coefficients to the *nearest ten thousandth*. Using this equation, find the wind chill factor, to the *nearest degree*, when the wind speed is 50 miles per hour. Based on your equation, if the wind chill factor is  $0^{\circ}$ , what is the wind speed, to the *nearest mile per hour*?

[6]  $y = 13.0134 - 7.3135 \ln x$ , -16, and 6, and appropriate work is shown.

[5] Appropriate work is shown, but one computational or rounding error is made.

or [5] The expression  $13.0134 - 7.3135 \ln x$  is written and -16 and 6 are found, and appropriate work is shown.

[4] Appropriate work is shown, but two or more computational or rounding errors are made.

or [4] A correct logarithmic regression equation is written, but either the wind chill factor or the wind speed is not found, but appropriate work is shown.

or [4] An incorrect logarithmic regression equation of equal difficulty is written, but appropriate answers are found for the wind chill factor and the wind speed, and appropriate work is shown.

[3] Appropriate work is shown, but one conceptual error is made.

or [3]  $y = 13.0134 - 7.3135 \ln x$ , -16, and 6, but no work is shown.

or [3] The expression  $13.0134 - 7.3135 \ln x$  is written and either -16 or 6 is found, and appropriate work is shown.

[2] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.

or [2]  $y = 13.0134 - 7.3135 \ln x$ , but no further correct work is shown.

or [2] An incorrect logarithmic regression equation of equal difficulty is written, but an appropriate answer is found for either the wind chill factor or the wind speed, and appropriate work is shown.

or [2] An incorrect regression equation of a lesser degree of difficulty is written, but appropriate answers are found for the wind chill factor and the wind speed, and appropriate work is shown.

or [2] -16 and 6, but no equation is written and no work is shown.

[1] An incorrect regression equation of a lesser degree of difficulty is written, but an

[1] appropriate answer is found for either the

wind chill factor or the wind speed, and appropriate work, is shown.

or [1] The expression  $13.0134 - 7.3135 \ln x$  is written, but no further correct work is shown.

or [1] -16 or 6, but no equation is written and no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

---