

Piece-Wise Extensions

① Your favorite dog groomer charges according to your dog's weight. If your dog is 15 pounds and under, the groomer charges \$35. If your dog is between 15 and 40 pounds, she charges \$40. If your dog is over 40 pounds, she charges \$40, plus an additional \$2 for each pound.

② You plan to sell I Love Math t-shirts as a fundraiser. The wholesale t-shirt company charges you \$10 a shirt for the first 75 shirts. After the first 75 shirts you purchase up to 150 shirts, the company will lower its price to \$7.50 per shirt. After you purchase 150 shirts, the price will decrease to \$5 per shirt. Write a function that models this situation.

③ What value of a would make this piecewise function **continuous**?

$$f(x) = \begin{cases} 3x^2 + 4 & \text{if } x < -2 \\ 5x + a & \text{if } x \geq -2 \end{cases}$$

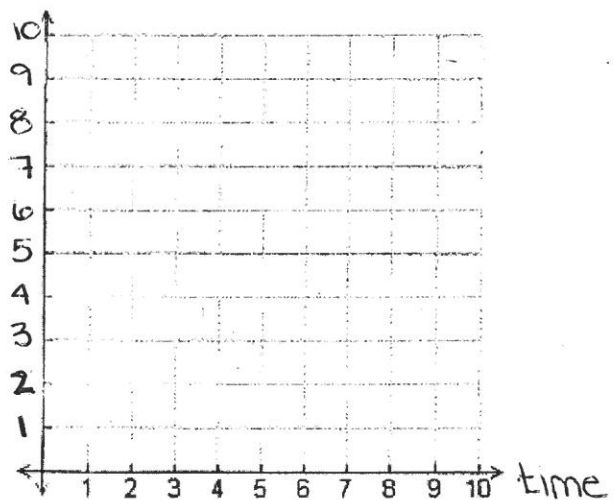
④ During a nine-hour snowstorm it snows at a rate of 1 inch per hour for the first two hours, at a rate of 2 inches per hour for the next six hours, and at a rate of 1 inch per hour for the final hour.

a. What are the dependent and control variables?

rate

b. Write the piecewise function.

c. Graph the piecewise function. Label your axis.



d. How much snow is there on the ground after 7 hours?