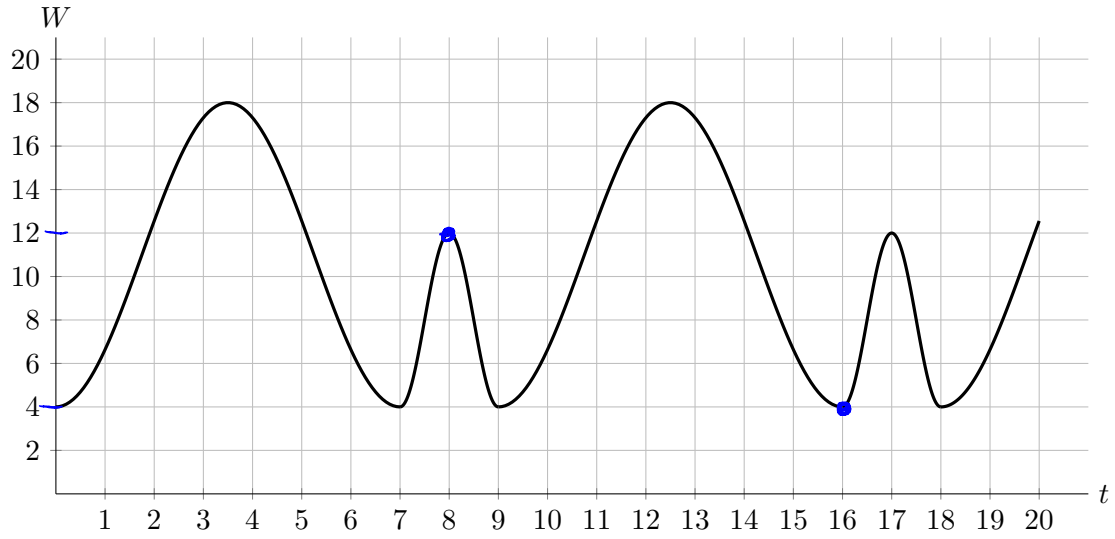
**2**. [11 points] As the Smashing Squash are touring, their merchandise varies in value in a way that can be modeled by a periodic function. Let $W = P(t)$ be the value (in thousands of dollars) of an autographed vinyl record at time $t$ (in months). Suppose that $P(t)$ is a periodic function with period less than 18 months. Part of the graph of $W = P(t)$ is shown below.




You do not need to show work for this problem.

**a**. [1 point] Find the average rate of change of $P(t)$ between $t = 8$ and $t = 16$.

**Answer:** $\frac{4-12}{16-8} = \frac{-8}{8} = -1$.

**b**. [2 points] Find the period of $P(t)$. **Include units** in your answer.

**Answer:** $17 - 8 = 9$ months

**c**. [2 points] Find the amplitude of the function $P(t)$. **Include units** in your answer.

**Answer:** $\frac{18-4}{2} = 7$ thousand dollars

**d**. [2 points] Find the equation of the midline of the function $P(t)$.

**Answer:** $W = 4 + 7 = 11$

**e**. [2 points] Find the smallest value of $t$ that satisfies $t > 20$ and at which point the record has a value of \$4,000.

**Answer:** $16 + 9 = 25$

**f**. [2 points] Let $k(t) = -100P(2t)$. What is the period of $k(t)$?

horizontal compression by a factor of $\frac{1}{2}$

**Answer:** $\frac{1}{2} \cdot 9 = 4.5$