AP Calculus AB
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Homework 0430e
Wednesday, April 30, 2020

Problem 1. Two particles move along the x-axis. For $0 \leq t \leq 8$, the position of particle P at time t is given by $x_P(t) = \ln(t^2 - 2t + 10)$, while the velocity of particle Q at time t is given by $v_Q(t) = t^2 - 8t + 15$. Particle Q is at position $x = 5$ at time $t = 0$.

(a) For $0 \leq t \leq 8$, when is particle P moving to the left?

(b) For $0 \leq t \leq 8$, find all times t during which the two particles travel in the same direction.

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(c) Find the acceleration of particle Q at time $t = 2$. Is the speed of particle Q increasing, decreasing, or neither at time $t = 2$? Explain your reasoning.

(d) Find the position of particle Q the first time it changes direction.