

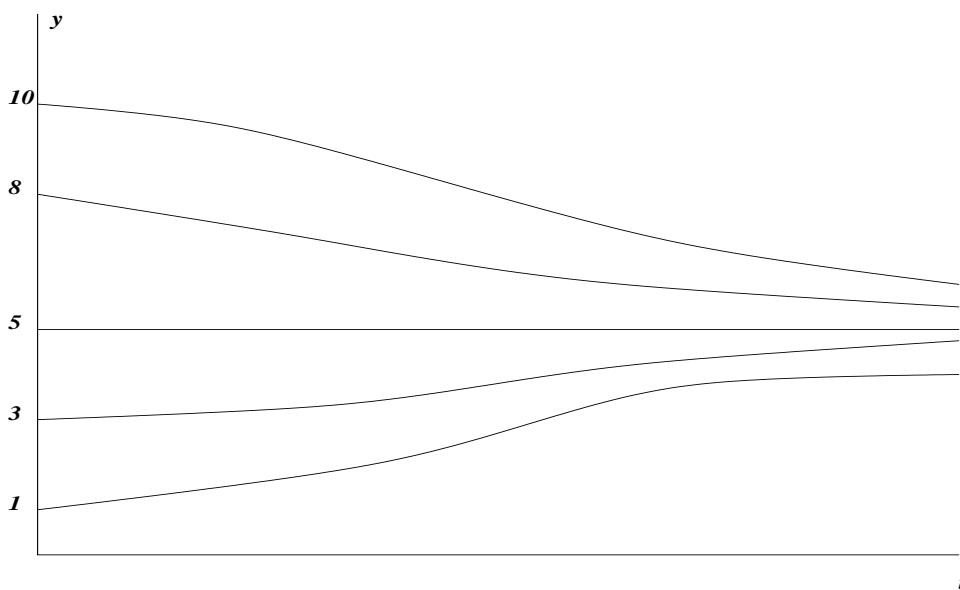
Mathematics 172 Homework

1. For the differential equation

$$\frac{dy}{dt} = 2y(20 - 4y)$$

(a) Find the constant solution. That is the solutions that have $\frac{dy}{dt} = 0$.
Answer: Do this by setting $2y(20 - 4y) = 0$ to get that the constant solutions are $y = 0$ and $y = 5$.

(b) Graph the solutions with $y(0) = 1$, $y(0) = 3$, $y(0) = 8$, and $y(0) = 10$.
Answer:



(c) Estimate $y(1,000)$ for the solution with $y(0) = 1$. *Answer:* $y(1,000) \approx 5$.
5. Estimate the $y(250)$ for the solution with $y(0) = 10$. *Answer:* $y(250) \approx 5$.

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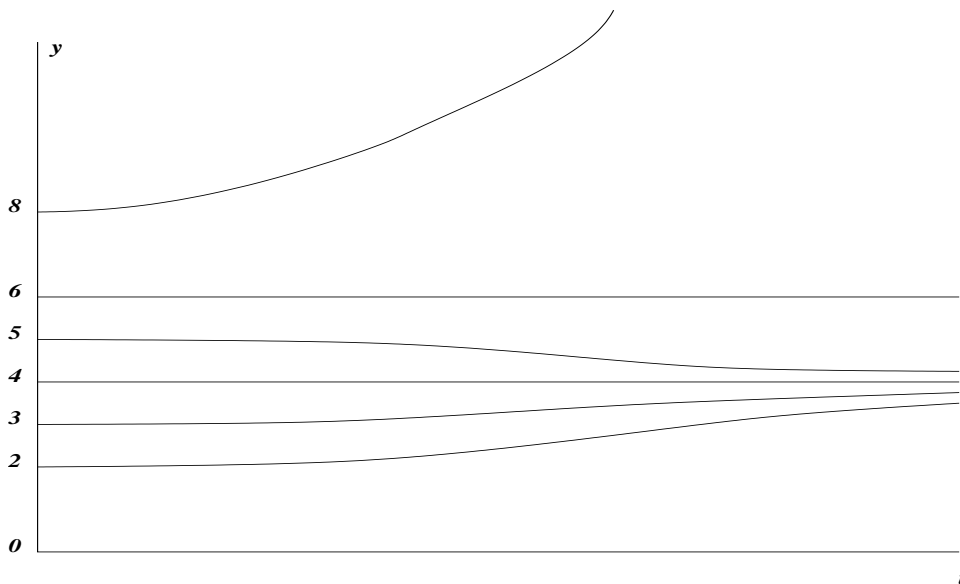
2. For the differential equation

$$\frac{dy}{dt} = y(y - 4)(y - 6)$$

(a) Find the constant solutions. *Answer:* $y = 0$, $y = 4$, and $y = 6$.

(b) Graph the solutions with $y(0) = 2$, $y(0) = 3$, $y(0) = 5$, and $y(0) = 8$.

Answer:



(c) Estimate $y(100)$ for the solution with $y(0) = 2$. *Answer:* $y(100) \approx 4$.

Estimate $y(4,431)$ for the solution with $y(0) = 3$. *Answer:* $y(4,431) \approx 4$.

Estimate $y(765)$ for the solution with $y(0) = 5$. *Answer:* $y(765) \approx 4$.