AP Calculus AB
Set 9 Answers

#1

a	$y = 10^6 e^{-\frac{t}{6}\ln 2} = 10^6 \cdot 2^{-\frac{t}{6}}$
b	Decreasing at $10^5 \ln 2$ gal/year.
c	$6\frac{\ln 20}{\ln 2}$ years after starting.

#2

a	$y = Ae^{-\ln x}$ or $y = \frac{A}{x}$ or $xy = A$ or $\ln\|y\| = -\ln\|x\| + C$
b	$y = \frac{Ae^{x^2}}{x}$ or $y = Ae^{x^2 - \ln x}$ or $\ln\|y\| = x^2 - \ln\|x\| + C$
c	$y = \frac{e^{x^2+1}}{x}$ or $\ln y = x^2 - \ln x + 1$

#3

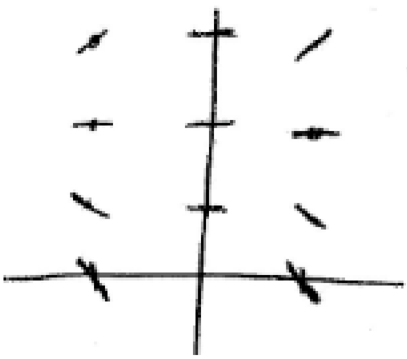
a	When $x = 3$, $\frac{dy}{dx} = 0$, & $\frac{d^2y}{dx^2} = 1/2$ $\therefore$ f has a local minimum at this point.
b	$y^2 = 6x - x^2 + 16$ $\quad y = -\sqrt{6x - x^2 + 16}$

#4

a	$\frac{19}{2}$
b	$y = \left(\frac{1}{4}x^2 + \frac{11}{4}\right)^2 = \frac{1}{16}(x^2+11)^2$

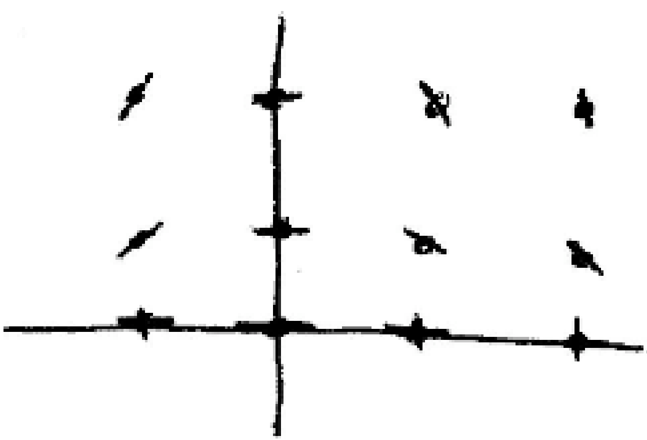
#5

a	See below
b	Slopes are negative at points (x, y) where $x \neq 0$ and $y <$
c	$y = 2 - 2e^{\frac{1}{5}x^5}$



#6

a	See Below
b	$y - 2 = 2(x+1)$
c	$y = \frac{4}{x^2+1}$



#7

a	See Below
b	the line $y=1$ satisfies the d.e., so $c=1$
c	$y = 1 - \frac{\pi}{\sin(\pi x) + \pi}$ for all x.