

8. (9 points) Recall that the Taylor series for  $\cos x$  about  $x = 0$  is given by  $1 - x^2/2! + x^4/4! - x^6/6! + \dots$ .

- (a) (5 pts.) The Taylor series for  $\cos x$  equals  $\cos x$  wherever it converges. For which  $x$ -values does the Taylor series for  $\cos x$  equal the function  $\cos x$ ? Give a precise step-by-step argument that justifies your answer. *No graphs are allowed as justification.*

- (b) (4 pts.) Find all the solutions to the equation

$$1 - \frac{(3x)^2}{2!} + \frac{(3x)^4}{4!} - \frac{(3x)^6}{6!} + \dots = 0.$$

You must show your work clearly and give exact answers. Calculator approximations or methods will receive no credit.