Michigan State University
STT 456 - Actuarial Models II
Class Test 1
Friday, 27 February 2015
BONUS: 20 points

Please write your name at the space provided:

Name: ____________________________

• You can earn a total of up to 20 points, to be added to your score in Class Test 1, by answering this one question.

• Please provide details of your workings in the appropriate spaces provided; partial points will be granted.

• Please write legibly. Use the back page for more spaces.

• Only identified students with diligent attendance will have this question marked.

An active \((a)\) employee of a company can leave the company because of one of 3 reasons: voluntary withdrawal \((w)\), retirement \((r)\) or death \((d)\). This is illustrated by the following diagram:

\[
\text{active (}a\text{)} \rightarrow \text{withdrawn (}w\text{)} \quad \text{active (}a\text{)} \rightarrow \text{retired (}r\text{)} \quad \text{active (}a\text{)} \rightarrow \text{dead (}d\text{)}
\]

You are given the following forces of transition:

• \(\mu_{aw} = 0.030\)

• \(\mu_{ar} = 0.005\)

• \(\mu_{ad} = 0.001\)

Calculate the probability an active employee, who left the company, left because of retirement.

(Please turn over for more spaces to write your solution.)
EXTRA PAGE FOR DETAILS OF SOLUTION