

Stat 98/198 HW #4 Due 3/3

27. A study of automobile accidents produced the following data:

Model year	Proportion of all vehicles	Probability of involvement in an accident
1997	0.16	0.05
1998	0.18	0.02
1999	0.20	0.03
Other	0.46	0.04

An automobile from one of the model years 1997, 1998, and 1999 was involved in an accident.

Determine the probability that the model year of this automobile is 1997 .

- (A) 0.22 (B) 0.30 (C) 0.33 (D) 0.45 (E) 0.50

28. A hospital receives $\frac{1}{5}$ of its flu vaccine shipments from Company X and the remainder of its shipments from other companies. Each shipment contains a very large number of vaccine vials.

For Company X's shipments, 10% of the vials are ineffective. For every other company, 2% of the vials are ineffective. The hospital tests 30 randomly selected vials from a shipment and finds that one vial is ineffective.

What is the probability that this shipment came from Company X?

- (A) 0.10 (B) 0.14 (C) 0.37 (D) 0.63 (E) 0.86

29. The number of days that elapse between the beginning of a calendar year and the moment a high-risk driver is involved in an accident is exponentially distributed. An insurance company expects that 30% of high-risk drivers will be involved in an accident during the first 50 days of a calendar year.

What portion of high-risk drivers are expected to be involved in an accident during the first 80 days of a calendar year?

- (A) 0.15 (B) 0.34 (C) 0.43 (D) 0.57 (E) 0.66

30. An actuary has discovered that policyholders are three times as likely to file two claims as to file four claims.

If the number of claims filed has a Poisson distribution, what is the variance of the number of claims filed?

- (A) $\frac{1}{\sqrt{3}}$ (B) 1 (C) $\sqrt{2}$ (D) 2 (E) 4

31. A company establishes a fund of 120 from which it wants to pay an amount, C , to any of its 20 employees who achieve a high performance level during the coming year. Each employee has a 2% chance of achieving a high performance level during the coming year, independent of any other employee.

Determine the maximum value of C for which the probability is less than 1% that the fund will be inadequate to cover all payments for high performance.

- (A) 24 (B) 30 (C) 40 (D) 60 (E) 120