

Question 1: Multiple choice: circle the best answer to each question:

(1)[2 points] The following table gives data for population and number of fatal motor vehicle accidents for Canada's four largest provinces for the year 2000:

| Province | Population (millions) | Number of Fatalities |
|------------------|-----------------------|----------------------|
| British Columbia | 4.1 | 421 |
| Alberta | 3.0 | 364 |
| Ontario | 11.7 | 849 |
| Quebec | 7.4 | 765 |

Which province has the lowest motor vehicle fatality rate per 100,000 residents?

- (a) British Columbia
 - (b) Alberta
 - (c) Ontario
 - (d) Quebec
 - (e) There is not enough information to determine the answer.
- (2)[2 points]** A person steps on the bathroom scale five times in succession and takes the mean of the resulting readings. By using the mean as the final measure of weight,
- (a) bias in the measurements will be reduced, but not the random error.
 - (b) random error in the measurements will be reduced, but not bias.
 - (c) both random error and bias will be reduced.
 - (d) neither random error nor bias will be reduced.
 - (e) the total of bias plus random error should be zero.
- (3)[2 points]** A measure can be valid yet the measurement
- (a) reliable.
 - (b) biased.
 - (c) unbiased.
 - (d) all of the above.
 - (e) none of the above.

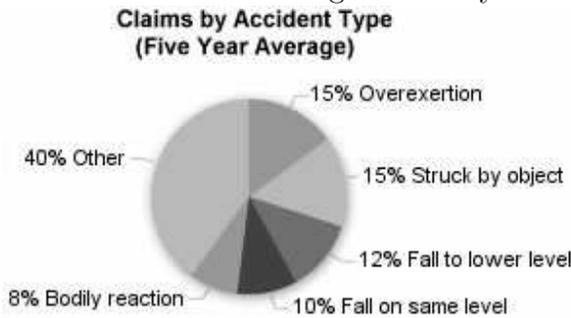
(4)[2 points] the following table summarizes the British Columbia median total family income for years 2001 through 2005:

| Year | Median total family income (\$) |
|------|---------------------------------|
| 2000 | 50,900 |
| 2001 | 51,700 |
| 2002 | 52,800 |
| 2003 | 53,600 |
| 2004 | 55,900 |
| 2005 | 58,500 |

The greatest percentage increase in median total family income occurred for years

- (a) 2000 – 2001
 - (b) 2001 – 2002
 - (c) 2002 – 2003
 - (d) 2003 – 2004
 - (e) 2004 – 2005
- (5)[2 points] The question “Would you like to see more math courses offered at Malaspina” was asked in a recent survey of 650 male and 550 female students. The survey reached the following conclusion: 30% of male and 50% of female students answered “yes”, for a total of 80% of students wishing to see more math courses offered. The total of 80% is incorrect; what is the correct percentage of students wishing to see more math courses offered (round to nearest percent)?
- (a) 39%
 - (b) 29%
 - (c) 40%
 - (d) 20%
 - (e) There is insufficient information to answer the question.

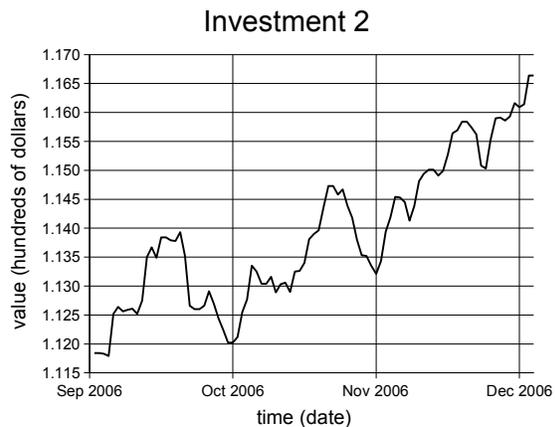
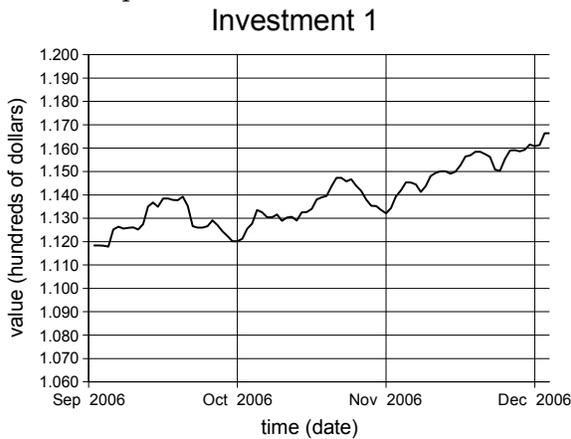
(6)[2 points] The following is a pie chart from WorkSafe BC summarizing the distribution of 1464 accidents in the oil and gas industry over the years 2001 – 2005.



How many injuries were due to falls or other causes? (rounded to nearest whole number)

- (a) 322
- (b) 1464
- (c) 586
- (d) 908
- (e) 22%

(7)[2 points] To the nearest \$10, which of the following two investments show a greater increase over the period Nov 2006 to Dec 2006?



- (a) Investment 1.
- (b) Investment 2.
- (c) Both are about the same.
- (d) They cannot be compared because the vertical scales are different.
- (e) They cannot be compared because line graphs are not appropriate for representing numerical data.

(8)[2 points] In the following stemplot

| | | | | | | | | | |
|---|--|---|---|---|---|---|---|---|---|
| 1 | | 2 | 2 | 2 | 2 | 2 | 8 | 9 | 9 |
| 2 | | 1 | 1 | 1 | 4 | 4 | 4 | | |
| 3 | | 5 | 6 | 6 | | | | | |
| 4 | | 3 | 4 | 5 | 5 | | | | |
| 5 | | 9 | 9 | | | | | | |
| 6 | | 0 | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | 7 | | | | | | | |

the maximum of the observations is

- (a) 99.
 - (b) also an outlier.
 - (c) 97.
 - (d) (a) and (b).
 - (e) (b) and (c).
- (9)[2 points] A normal distribution with mean 10 and standard deviation 5 has 68% of observations between
- (a) 10 and 15.
 - (b) 5 and 10.
 - (c) 5 and 15.
 - (d) -5 and 15.
 - (e) 95% and 99.7%.
- (10)[2 points] In a certain normal distribution the range of observations within two standard deviations of the mean is 147 to 589. What is the mean of the distribution?
- (a) 368.
 - (b) 184.
 - (c) The same as the median.
 - (d) (a) and (c).
 - (e) (b) and (c).

Question 2 The age as of last birthday for 11 students is reported as follows:

17, 18, 18, 18, 19, 19, 20, 21, 22, 23, 47

(a)[5 points] Give the five number summary for this data.

(b)[3 points] Compute \bar{x} .

(c)[2 points] What is a better measure of center for this data: the mean or median? Explain.

Question 3 IQ scores are normally distributed with mean 100.

(a)[4 points] If 99.7 of all IQ scores fall within the range of 55 to 145, what is the standard deviation of the distribution of IQ scores?

(b)[3 points] Find the IQ score achieved by the top 2.5% of those taking the test.

(c)[3 points] What percentage of those taking the IQ test score higher than 145?

Question 4 The lifetime of a certain type of light bulb is normally distributed with a mean of 300 days and a standard deviation of 40 days.

(a)[3 points] What proportion of light bulbs last more than 392 days?

(b)[3 points] What proportion of light bulbs last at least 200 days?

(c)[4 points] How many days does it take for 99.9% of light bulbs to fail?