

Statistics

1. Jermaine scored 75% on a test. The class average was 78% with a standard deviation of 1.5%. What is Jermaine's *z-score*?

A) -2 B) 2 C) 24 D) 29

2. The table below shows the pairs of shoes sold each month by Foot Locker over a period of one year.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Shoes Sold	27	24	26	23	22	24	22	21	21	28	26	29

Determine the standard deviation for the number of watches sold.

A) 2.63 B) 2.75 C) 4.08 D) 4.42

3. A manufacturer collects the following data for the weights of their products. Calculate the **mean, median, mode** and **standard deviation** for the following set of data.

Frequency	4	3	7	10	1	1	5
Weight (g)	65	43	46	37	27	15	13

Determine whether this data resembles a normal distribution by finding the percentage of results that fall within one standard deviation above and below (to the right and left of) the mean.

Show your data by sketching a graph as well

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4. Two high school students wrote a mathematics exam. Annabelle scored 93% in a class where the mean was 83% and the standard deviation was 6%. Liam scored 78% in a class where the mean was 67% and the standard deviation was 5%.

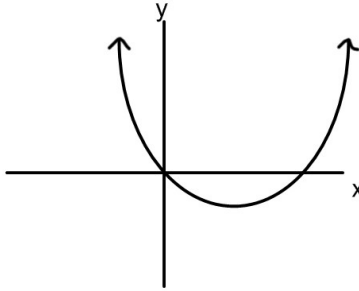
a) Using z-scores, compare the performance of Annabelle and Liam. Show your work.

b) If the scores were normally distributed, what percentage of scores would lie below Annabelle's score? Show your work.

Show the data by sketching a graph

Quadratic Functions

5. Which of the quadratic equations best represents the following function:



- A) $y = x^2 + 2x + 1$ B) $y = x^2 - 2x$ C) $y = -x^2 + 2x + 1$ D) $y = -x^2 - 2x$

6. How many solutions does the following quadratic equation have?

$$0 = x^2 + 2x + 2$$

- A) 0
B) 1
C) 2
D) ∞

7. A basketball is shot from the 3-point line. The height of the ball is modeled by the function (in feet):

$$y = -2t^2 + 20t + 6$$

You can sketch the graph in order to answer the following questions

Logical Reasoning

8. Kelis makes a claim that all chairs have 4 legs. Betty wants to prove Kelis wrong so she shows her a 3-legged chair. Betty has provided a:

- A) Conjecture B) Counterexample C) Proof D) Inductive reasoning

9. A study showed the following five-year chart for total snowfall (mm) in Winnipeg.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	150.5	27.1	13.7	139.8	5.3	0	0	0	0	24.2	167.4	113.2
2008	249.6	45.8	13.8	90.2	8.6	0	0	0	0	15.4	136.6	160.8
2009	283.6	57.0	22.4	70.0	2.8	0	0	0	0	7.8	350.8	146.0
2010	181.4	116.0	14.8	76.2	37.0	0	0	0	0	15.2	116.2	210.6
2011	137.6	68.6	75.2	16.2	4.2	0	0	0	0	9.6	177.0	197.2

a) What conjecture can you make based on the data?

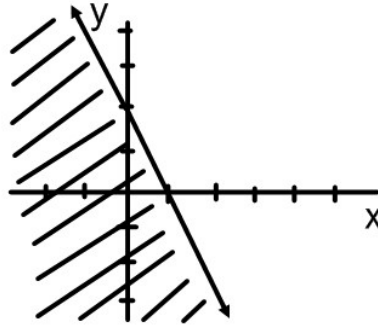
b) Use the data to support (not prove) your conjecture

c) Do you think your conjecture convincing? Make an argument to explain why or why not.

Systems of Linear Inequalities

10. Which inequality is represented by the graph to the right?

- A) $y < 2x + 2$
 B) $y < -2x + 2$
 C) $y < 1/2x + 2$
 D) $y < -1/2x + 2$



11. What is the Domain and Range of the Solution Set for the following system of linear inequalities?

$$\begin{aligned} y &\leq -x + 4 \\ x &\geq 0 \\ y &\geq 0 \end{aligned}$$

- A) Domain: $\{x \geq 0\}$ Range: $\{y \geq 0\}$
 B) Domain: $\{0 \leq x \leq 4\}$ Range: $\{0 \leq y \leq 4\}$
 C) Domain: $\{x \leq 4\}$ Range: $\{y \leq 4\}$
 D) Domain: $\{x \leq -4\}$ Range: $\{y \leq -4\}$

12. Consider the following group of inequalities:

$$\begin{aligned} y &\leq -x + 5 \\ x &\geq 1 \\ y &\geq 1 \end{aligned}$$

- a) Draw a graph to represent the solution set for these inequalities (shade in a region and clearly mark it as the solution set)

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- b) Find the points (values for x and y) for all 3 corners of the solution set. Show your work here and label the original graph as well.
- c) Choose a point that is not in the solution set and *prove* that it does not work as a solution (identify which inequalities it breaks)

13. A store sells two kinds of products, CDs and DVDs

- For every CD that is sold, 3 DVDs are sold
- They normally sell at least 50 items a week

The store is trying to reduce the shelf space required in the store

- A CD takes 30 cm^3 of space and a DVD takes 75 cm^3

- a) What are the variables for this situation?
- b) Describe the Domain and Range of the variables
- c) Write two inequalities to represent the restrictions of the situation
- d) Create an objective function that describes the stores goal

Trigonometry

14. Which of the following **cannot** be used for the sine law?

A) $\frac{a}{\sin A} = \frac{b}{\sin B}$

B) $\frac{b}{\sin B} = \frac{c}{\sin C}$

C) $\frac{\sin C}{c} = \frac{\sin A}{a}$

D) $\frac{a}{\sin A} = \frac{\sin B}{b}$

15. If the ratio between the opposite and hypotenuse side of a right triangle is 0.5592, then the corresponding angle would be:

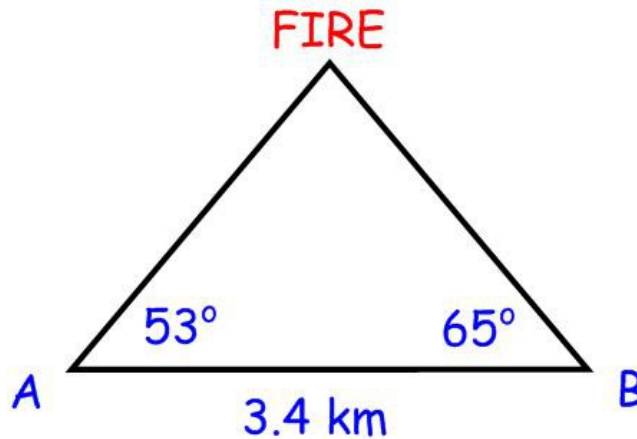
A) 59°

B) 9.8°

C) 56°

D) 34°

16. Two Banff National Park rangers in their own fire towers spot a fire. The two towers are 3.4 km apart.



a) The above diagram is *not* drawn to scale. Using the information given but without actually finding the distances, determine which tower is closer to the fire?

Explain your reasoning.

b) Determine the distance, in km, from the closer tower to the fire

17. Two trees are 150 m apart. From a point midway between them, the angles of elevation to their tops are 13° and 19° .

a) Draw a diagram to represent the situation, label all distances.

b) How much taller is one tree than the other?

Measurement

[see take home test for review]