Mathematics Standard 1

HSC Marking Feedback 2019

Question 11

Students should:

- show all working on the line provided.

In better responses, students were able to:

- calculate the total amount by adding one $8 travel allowance only.

Areas for students to improve include:

- reading the question carefully to see if an allowance is per hour or per shift
- knowing that an allowance is added to the total earned.

Question 12

In better responses, students were able to:

- set up a correct trig ratio before attempting to solve the problem.

Areas for students to improve include:

- identifying the correct trig ratio for the given sides
- understanding that $12°$ needs a trigonometric term in front of it.

Question 13

In better responses, students were able to:

- show structured setting out
- calculate interest as total repayments minus the amount borrowed.

Areas for students to improve include:

- identifying if a repayment is per annum or per month
- understanding the difference between finding repayments or interest.

Question 14 (adapted common question with Standard 2)

Students should:

- be able to determine a post-GST price given the pre-GST price.

In better responses, students were able to:

- apply the 10% GST to the pre-GST price
- recognise that they could simply add the GST (given) to the pre-GST price (given).

Areas for students to improve include:

- finding 10% of an amount as many simply added '10%', rather than 10% of pre-GST price (resulting in $7.10)
- showing all working as in the event of an incorrect value for A, working is required to be awarded the mark for the total.

Question 15

In better responses, students were able to:

- find the area of the square and the semicircle
- use the radius for their circle calculation.

Areas for students to improve include:

- distinguishing if perimeter or area is required
- setting work out sequentially so that progress can be followed
- remembering to halve their circle area to find the semicircle area.

Question 16

In better responses, students were able to:

- show clear substitution into the $I = PRN$ formula.

Areas for students to improve include:

- understanding if the time period is 'months' or 'years'
- using the compound interest formula and being able to identify it on the Reference Sheet.

Question 17

Students should:

- be able to draw a connected, weighted network based on information from a table.

In better responses, students were able to:

- construct the network diagram and indicate weightings correctly
- make adjustments in the event of incorrect connections.

Areas for students to improve include:

- writing weightings correctly and knowing that 1 h 50 min is not 1.5 h
- only drawing connections that exist in the table.

Question 18

In better responses, students were able to:

- identify the travelling distance was outward and back.

Areas for students to improve include:

- identifying if a letter represents the endpoint of a line or a section of the graph
- recognising that the slope of the line and not its length indicates the speed.

Question 19 (common question with Standard 2)

Students should:

- be able to identify the lower quartile, the upper quartile and the interquartile range of a simple distribution
- be able to apply the mathematical concept of an outlier to determine whether the shortest member was an outlier.

In better responses, students were able to:

- calculate the interquartile range
- apply the formula to determine the boundary for an outlier and draw an accurate conclusion from their calculation.

Areas for students to improve include:

- not confusing range with interquartile range (hence the shortest height became Q_1)
- acknowledging the outlier condition, how to apply it and using the IQR, not the median, in the calculation
- remembering to draw a conclusion.

Question 20

Students should be able to:

- identify common symbols used in house plans such as windows and doors
- measure correctly and apply a scale.

In better responses, students were able to:

- recognise the symbol for a window and could count the number correctly (a)
- measure and convert measurements to real distances using the scale provided and determine the actual perimeter of the kitchen (b).

Areas for students to improve include:

- measuring correctly so that 3.5 cm does not become 4 cm
- converting scales
- reading carefully to see if area or perimeter is required.

Question 21

In better responses, students were able to:

- show the correct numbers substituted into the correct formula as this formula can be found properly labelled on the reference sheet.

Areas for students to improve include:

- using the appropriate formula rather than doing a long series of calculations that are subtracted from the previous answer based on 14%.

Question 22

In better responses, students were able to:

- provide an appropriate answer and clearly explain their reasoning.

Areas for students to improve include:

- making reasonable responses, for example, a common error was 'that the colours themselves should be displayed'.

Question 23

Students should:

- show the complete table of values for a non-linear model
- clearly identify their coordinates on a number plane.

In better responses, students were able to:

- identify the model as an exponential (c)
- complete the scale on the y-axis and plot all correct points.

Areas for students to improve include:

- completing scales on relevant axis
- plotting all points from their table of values
- identifying that a non-linear model does not go in a straight line.

Question 24

In better responses, students were able to:

- calculate the percentage for the number 3
- calculate the number of times the number 6 or 2 was rolled and then the total percentage.

Areas for students to improve include:

- calculating percentages
- understanding the term 'bias'.

Question 25

Students should:

- recognise the appropriate perimeter formula of a sector from the reference sheet.

In better responses, students were able to:

- identify the correct radius, angle and formula.

Areas for students to improve include:

- finding arc length as opposed to area of a sector
- knowing that the radii needed to be added to the arc length for a perimeter.

Question 26

Students should:

- be able to determine a 5-day wage given the normal pay rate
- set out calculations in a clear, organised manner.

In better responses, students were able to:

- take account of the number of hours worked at normal pay and at time-and-a-half in order to calculate wages
- calculate the normal pay for five days, rather than one.

Areas for students to improve include:

- calculating overtime payments and sum all components to determine total cost
- calculating the number of hours worked and subtracting the lunch hour
- presenting their working to indicate what figures are used in calculations, especially necessary in the event of the final, or partial, answers being incorrect.

Question 27

In better responses, students were able to:

- draw a correct line of best fit (a) and read the correct coordinate (b).

Areas for students to improve include:

- drawing an accurate line of best fit for the data given
- using their line of best fit to state the correct prediction.

Question 28 (common question with Standard 2)

Students should be able to:

- apply an algorithm correctly to find the minimum spanning tree
- draw a minimum spanning tree and add distances correctly.

In better responses, students were able to:

- highlight the minimum spanning tree on their question which was helpful for them to successfully transfer this to the answer box
- use the diagram to cross out path CH to visually understand what was being asked.

Areas for students to improve include:

- interpreting the closed section of the network
- looking at a variety of routes to find the shortest if they do not recall the algorithms.

Question 29

In better responses, students were able to:

- identify the correct ratio for use on a patio and use this correctly to determine the amount of sand needed
- understand that the ratio added to 10 parts.

Areas for students to improve include:

- understanding of ratios and the correct operation to perform for a required process.

Question 30 (adapted common question with Standard 2)

Students should:

- understand the phrase 'break-even' and how to identify it
- know how to find profit given cost and revenue.

In better responses, students were able to:

- show their reasoning on how to find profit from the graph
- read and interpret the scale correctly from the diagram.

Areas for students to improve include:

- understanding how to find profit from cost and revenue
- reading and using a variety of scales and interpreting the given information.

Question 31 (common question with Standard 2)

In better responses, students were able to:

- find AC by using either Pythagoras' theorem or the cosine rule
- use right-angled trigonometry ($\cos\theta = \frac{A}{H}$) to find θ.

Areas for students to improve include:

- remembering to square root their answer when using Pythagoras' theorem or the cosine rule
- practising with two triangles of different orientations and identifying the correct trig ratio
- avoiding rounding too soon when solving problems with several steps.

Question 32 (common question with Standard 2)

Students should:

- read the question carefully as to whether simple or compound interest is required
- be able to recognise when their answer makes sense in relation to the question.

In better responses, students were able to:

- convert yearly rates to daily rates
- calculate a correct compound interest rate for the time period.

Areas for students to improve include understanding :

- that the number of days for credit card interest is inclusive of the end days (this was stated in the question)
- of the term ‘minimum payment’ because after finding their minimum payment, students often continued to perform further operations on their answer.

Question 33

In better responses, students were able to:

- use rise/run correctly to find $\frac{4}{7}$ (a)
- even with a non-attempt or incorrect answer for part (a), complete the two-step conversion required (b).

Areas for students to improve include:

- writing a direct variation equation with/without the template provided
- ensuring they read the question to understand that a 'fraction' was required rather than a decimal approximation.

Question 34

Students should:

- be familiar with a three/four step equation, involving a fraction and parentheses.

In better responses, students were able to:

- solve the equation using routine techniques
- establish the correct answer by substitution.

Areas for students to improve include:

- attempting a question by substituting the values into the correct variables so as to gain some marks rather than not attempting the question.

Question 35

Students should:

- recognise and know how to use simple interest and compound interest formulae

- understand the term ‘per annum’.

In better responses, students were able to:

- show how to find the difference between the accounts
- use both simple interest formula and compound interest formula to find balances.

Areas for students to improve include:

- showing their substitutions into the relevant formulae
- being aware that the simple interest formula only calculates the interest and that this needs to be added to the original amount to find the future value.

Question 36

Students should be able to:

- find areas of basic plane shapes
- convert between measurement units, m to cm and area unit conversions.

In better responses, students were able to:

- find the area of a triangle in square metres
- understand how to find the area of the garden through the subtraction of the inside rectangle from the outside rectangle
- convert between units readily.

Areas for students to improve include:

- finding the area of triangles and rectangles
- converting between units
- finding the lengths of unknown sides before finding areas.