Education Quality and Accountability Office

EQAO

Assessment of Reading, Writing and Mathematics:
Junior Division

Released 2010 Assessment: Mathematics

Item-Specific Rubrics and Sample Student Responses with Annotations

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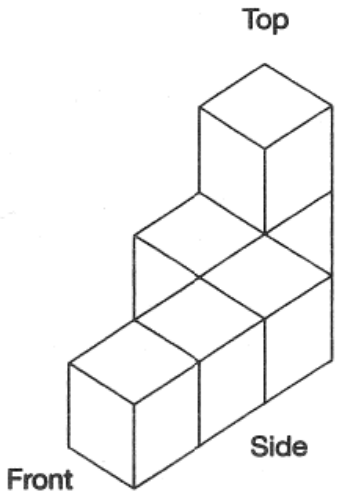
Scoring Guide for Junior Mathematics Open-Response Question 7

Code	Descriptor
B	• Blank: nothing written or drawn in response to the question
I	• Illegible: cannot be read; completely crossed out/erased; not written in English • Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • Off topic: no relationship of written work to the question
10	Application of knowledge and skills to sketch a top, a front and a side view of Sydney's figure shows limited effectiveness due to • misunderstanding of concepts • incorrect selection or misuse of procedures
20	Application of knowledge and skills to sketch a top, a front and a side view of Sydney's figure shows some effectiveness due to • partial understanding of the concepts • errors and/or omissions in the application of the procedures
30	Application of knowledge and skills to sketch a top, a front and a side view of Sydney's figure shows considerable effectiveness due to • an understanding of most of the concepts • minor errors and/or omissions in the application of the procedures
40	Application of knowledge and skills to sketch a top, a front and a side view of Sydney's figure shows a high degree of effectiveness due to • a thorough understanding of the concepts • an accurate application of the procedures (any minor errors and/or omissions do not detract from the demonstration of a thorough understanding)

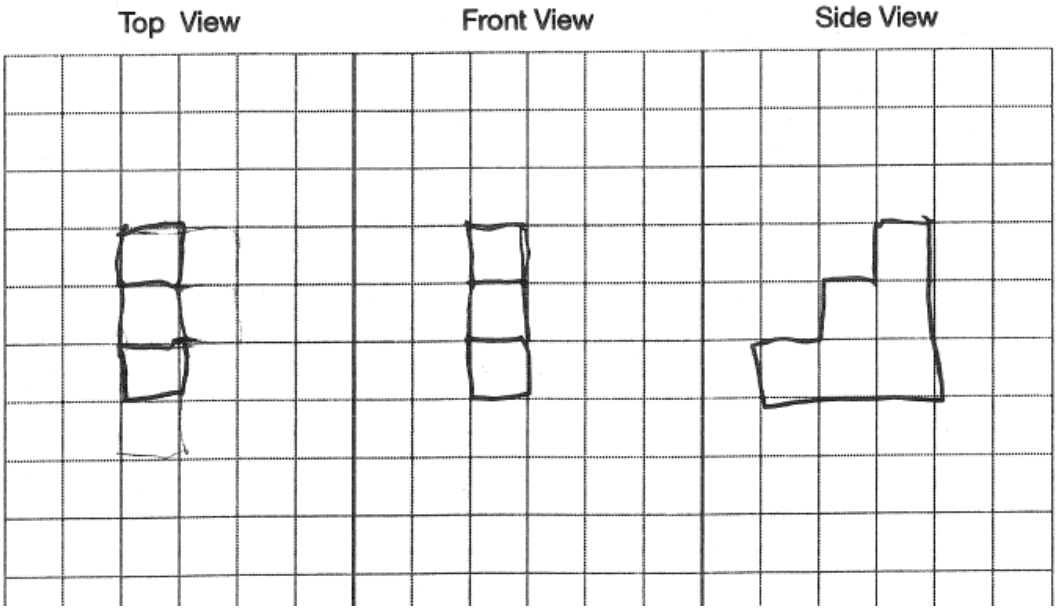
Scoring Guide for Junior Mathematics Open-Response Question 7

Code 10

Sydney makes the figure below with 6 linking cubes.



Draw a top, a front and a side view of Sydney's figure on the grid below.

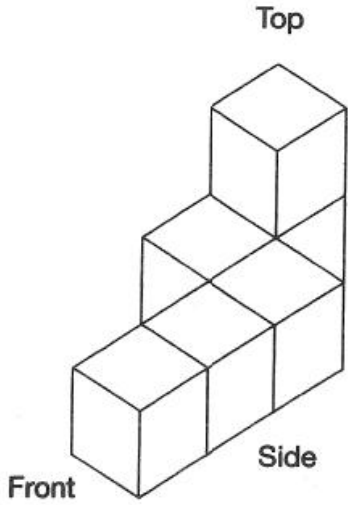


Annotation:
Student demonstrates a misunderstanding of concepts; all three views are incorrectly represented.

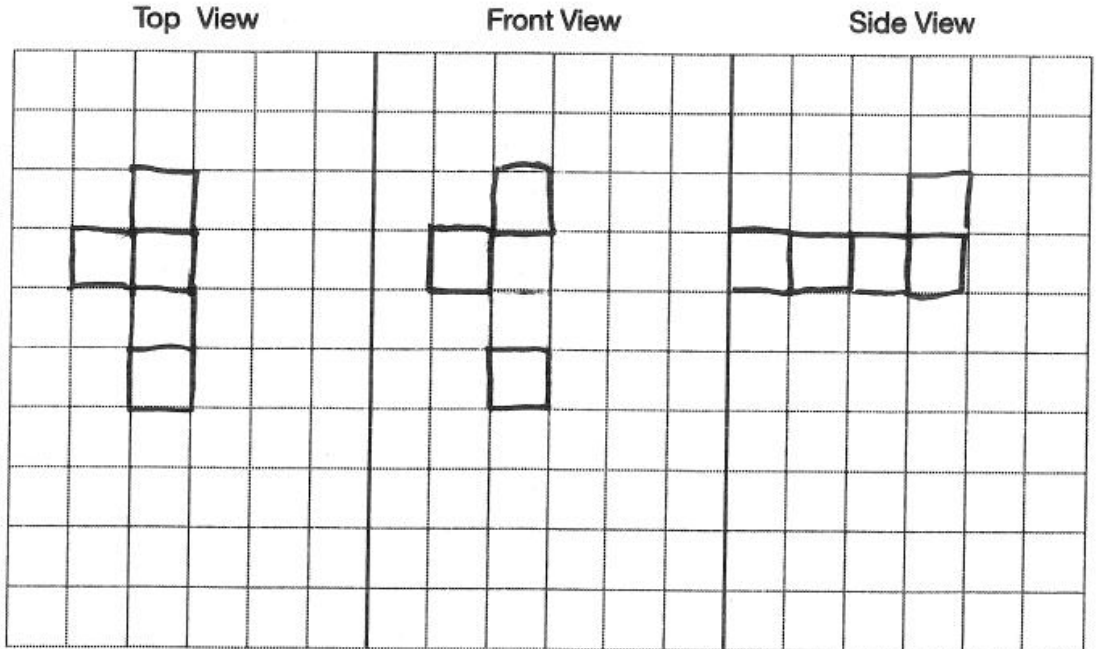
Scoring Guide for Junior Mathematics Open-Response Question 7

Code 20

Sydney makes the figure below with 6 linking cubes.



Draw a top, a front and a side view of Sydney's figure on the grid below.

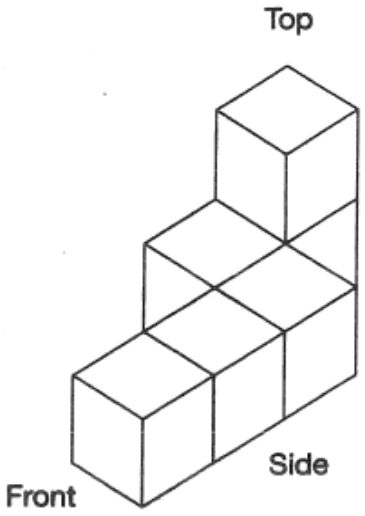


Annotation:
Student demonstrates a partial understanding of the concepts; accurately represents the side view of the figure but the top view has a misplaced face and the front view contains a disconnected face.

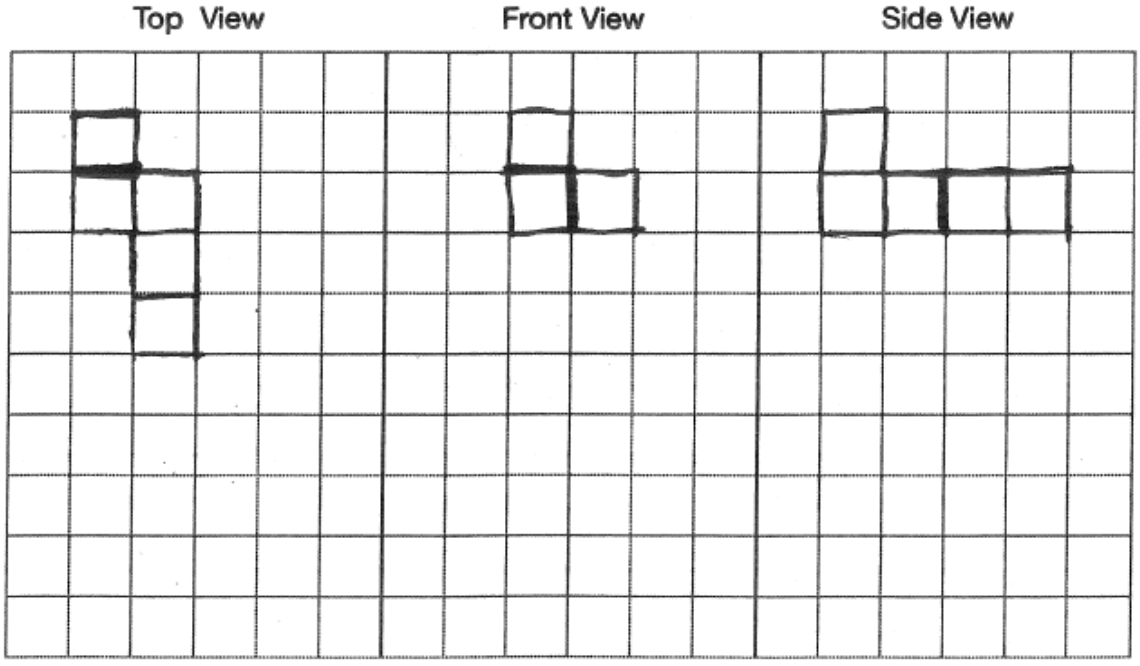
Scoring Guide for Junior Mathematics Open-Response Question 7

Code 30

Sydney makes the figure below with 6 linking cubes.



Draw a top, a front and a side view of Sydney's figure on the grid below.

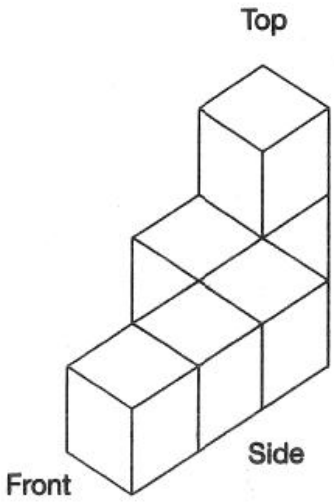


Annotation:
Student demonstrates an understanding of most of the concepts; accurately represents top and front views but the side view has single upper face on the wrong end.

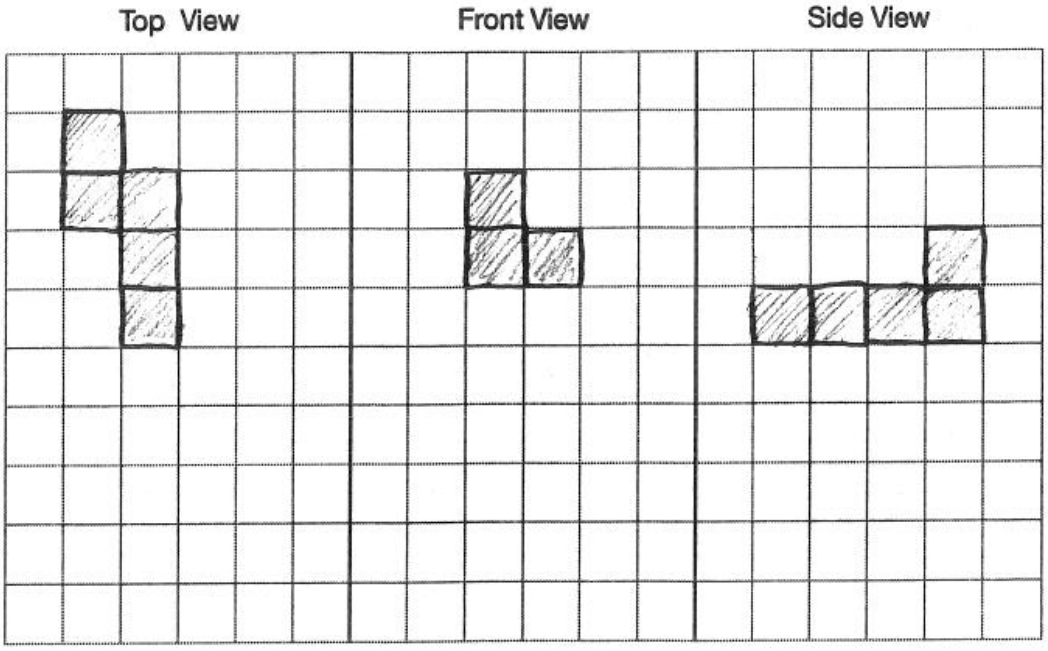
Scoring Guide for Junior Mathematics Open-Response Question 7

Code 40

Sydney makes the figure below with 6 linking cubes.



Draw a top, a front and a side view of Sydney's figure on the grid below.



Annotation:
Student demonstrates a thorough understanding of the concepts; accurately represents the figure with top, front and side views.

Scoring Guide for Junior Mathematics Open-Response Question 8

Code	Descriptor
B	• Blank: nothing written or drawn in response to the question
I	• Illegible: cannot be read; completely crossed out/erased; not written in English • Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • Off topic: no relationship of written work to the question
10	Application of knowledge and skills to compare fractions by determining which fractions represent equal values shows limited effectiveness due to • misunderstanding of concepts • incorrect selection or misuse of procedures
20	Application of knowledge and skills to compare fractions by determining which fractions represent equal values shows some effectiveness due to • partial understanding of the concepts • errors and/or omissions in the application of the procedures
30	Application of knowledge and skills to compare fractions by determining which fractions represent equal values shows considerable effectiveness due to • an understanding of most of the concepts • minor errors and/or omissions in the application of the procedures
40	Application of knowledge and skills to compare fractions by determining which fractions represent equal values shows a high degree of effectiveness due to • a thorough understanding of the concepts • an accurate application of the procedures (any minor errors and/or omissions do not detract from the demonstration of a thorough understanding)

Scoring Guide for Junior Mathematics Open-Response
Question 8

Code 10

Consider the fractions shown below.

$\frac{3}{4}, \frac{18}{25}, \frac{15}{20}, \frac{75}{100}$

Which fractions represent equal values?

Justify your answer. None of the fractions are equal they all have 25 left, 1 left, 7 left, and 5 left. What I did was make squares and colour $\frac{3}{4}$'s or $\frac{75}{100}$ and that would give me my answer.

Annotation:
Student demonstrates a misunderstanding of concepts; comparisons are not made using a common form or denominator; conclusion is incorrect.

Scoring Guide for Junior Mathematics Open-Response Question 8

Code 20

Consider the fractions shown below.

$\frac{3}{4}, \frac{18}{25}, \frac{15}{20}, \frac{75}{100}$

Which fractions represent equal values?

Justify your answer.

Only the fraction $\frac{3}{4}$ and $\frac{15}{20}$ represent equal values

$\frac{3}{4} \overset{\times 5}{=} \frac{15}{20}$
$\times 5$

Annotation:
Student demonstrates partial understanding of the concepts; determines through multiplication that 3/4 and 15/20 are equal values; does not determine that 75/100 is also an equal value and does not consider 18/25.

Scoring Guide for Junior Mathematics Open-Response Question 8

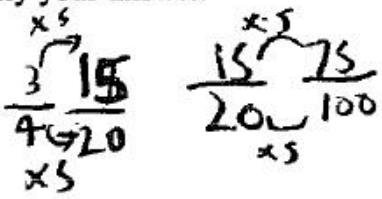
Code 30

Consider the fractions shown below.

$\frac{3}{4}, \frac{18}{25}, \frac{15}{20}, \frac{75}{100}$

Which fractions represent equal values?

Justify your answer.



Those two Represent equal values because you can multiply it an get the other number.

Annotation:
Student demonstrates understanding of most of the concepts; uses multiplication to prove equivalency of three of the fractions; does not consider 18/25.

Scoring Guide for Junior Mathematics Open-Response Question 8

Code 40

Consider the fractions shown below.

$\frac{3}{4}, \frac{18}{25}, \frac{15}{20}, \frac{75}{100}$

Which fractions represent equal values?

Justify your answer.

$\frac{3}{4} = \frac{75}{100}$ $\frac{18}{25} = \frac{72}{100}$ $\frac{15}{20} = \frac{75}{100}$

$\frac{75}{100} = \frac{3}{4} = \frac{15}{20} > \frac{18}{25}$

Annotation:
Student demonstrates a thorough understanding of the concepts; expresses each fraction out of 100 to compare the fractional amounts including 18/25.

Scoring Guide for Junior Mathematics Open-Response Question 9

Code	Descriptor
B	• Blank: nothing written or drawn in response to the question
I	• Illegible: cannot be read; completely crossed out/erased; not written in English • Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • Off topic: no relationship of written work to the question
10	Problem-solving process to demonstrate an understanding of mean by determining Todd's missing test scores shows limited effectiveness due to • minimal evidence of a solution process • limited identification of important elements of the problem • too much emphasis on unimportant elements of the problem • no conclusions presented • conclusion presented without supporting evidence
20	Problem-solving process to demonstrate an understanding of mean by determining Todd's missing test scores shows some effectiveness due to • an incomplete solution process • identification of some of the important elements of the problem • some understanding of the relationships between important elements of the problem • simple conclusions with little supporting evidence
30	Problem-solving process to demonstrate an understanding of mean by determining Todd's missing test scores shows considerable effectiveness due to • a solution process that is nearly complete • identification of most of the important elements of the problem • a considerable understanding of the relationships between important elements of the problem • appropriate conclusions with supporting evidence
40	Problem-solving process to demonstrate an understanding of mean by determining Todd's missing test scores shows a high degree of effectiveness due to • a complete solution process • identification of all important elements of the problem • a thorough understanding of the relationships between all of the important elements of the problem • appropriate conclusions with thorough and insightful supporting evidence

Scoring Guide for Junior Mathematics Open-Response Question 9

Code 10

Eric and Todd take 4 science tests. The table below shows Eric's 4 scores and 2 of Todd's scores.

Science Test Scores

Student	Test 1	Test 2	Test 3	Test 4	Mean test score
Eric	86	79	85	82	83
Todd	83	85	76	89	87

Todd's mean for the four tests is five points higher than Eric's. Complete the table above by entering Todd's mean test score and possible scores for his Test 1 and Test 3.

Justify your answers.

For test 1 todd got: 83
Test 3: 76

Todds mean: 87
Eric: 83

Annotation:
Student demonstrates minimal evidence of a solution process; reports an accurate mean for Eric with no justification; Todd's mean is not 5 points higher and choice of test scores do not support this mean.

Scoring Guide for Junior Mathematics Open-Response Question 9

Code 20

Eric and Todd take 4 science tests. The table below shows Eric's 4 scores and 2 of Todd's scores.

Science Test Scores

Student	Test 1	Test 2	Test 3	Test 4	Mean test score
Eric	86	79	85	82	83
Todd	91	85	90	89	88

Todd's mean for the four tests is five points higher than Eric's. Complete the table above by entering Todd's mean test score and possible scores for his Test 1 and Test 3.

Justify your answers. I know that Todds mean is higher than Erics because if Todds goes up by 5 everytime than you know that Todd is going to get a better score than Eric. Todd get 88 and Eric got 83.

Annotation:
Student demonstrates an incomplete solution process; correctly determines the mean for Eric and uses it to determine Todd's mean score; inaccurate explanation of how they determined Todd's missing scores (adds 5 to Eric's test scores to arrive at Todd's scores for Test 1 and Test 3).

Scoring Guide for Junior Mathematics Open-Response Question 9

Code 30

Eric and Todd take 4 science tests. The table below shows Eric's 4 scores and 2 of Todd's scores.

Science Test Scores

Student	Test 1	Test 2	Test 3	Test 4	Mean test score
Eric	86	79	85	82	83
Todd	91	85	90	89	88

Todd's mean for the four tests is five points higher than Eric's. Complete the table above by entering Todd's mean test score and possible scores for his Test 1 and Test 3.

Justify your answers.

$91+85+90+89=355 \div 4=88.75.$
Rounding it = about 88 – 89.

Annotation:

Student shows considerable effectiveness by identifying most of the important elements of the problem; accurately determines Eric's mean but adds 5 to Eric's Test 1 and Test 3 scores and accurately calculates Todd's mean based on these.

Scoring Guide for Junior Mathematics Open-Response Question 9

Code 40

Eric and Todd take 4 science tests. The table below shows Eric's 4 scores and 2 of Todd's scores.

Science Test Scores

Student	Test 1	Test 2	Test 3	Test 4	Mean test score
Eric	86	79	85	82	83
Todd	90	85	88	89	88

Todd's mean for the four tests is five points higher than Eric's. Complete the table above by entering Todd's mean test score and possible scores for his Test 1 and Test 3.

Justify your answers.

Eric

86+79+85+82=332

332 ÷ 4 = 83

∴ Eric's mean is 83.

Todd

83 + 5 = 88

332+5-89-85=81.

81+85+88+89 = 343 ÷ 4 = 85.75

90+85+89+89 = 353 ÷ 4 = 88.25

90+85+88+89 = 352 ÷ 4 = 88

∴ Todd got 90 on his first test and 88 on his third test

Annotation:

Student demonstrates a complete solution process; student accurately calculates the mean for Eric, uses it to find the mean for Todd and then solves for the two missing test scores (which total 178) using guess and check. Note: 332+5-89-85=81 seems to be an experiment to start the process.

Scoring Guide for Junior Mathematics Open-Response Question 10

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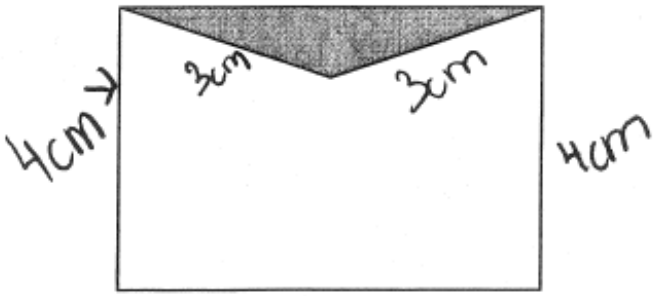
10	Problem-solving process to determine the area of the unshaded part of the rectangle shows limited effectiveness due to • minimal evidence of a solution process • limited identification of important elements of the problem • too much emphasis on unimportant elements of the problem • no conclusions presented • conclusion presented without supporting evidence
20	Problem-solving process to determine the area of the unshaded part of the rectangle shows some effectiveness due to • an incomplete solution process • identification of some of the important elements of the problem • some understanding of the relationships between important elements of the problem • simple conclusions with little supporting evidence
30	Problem-solving process to determine the area of the unshaded part of the rectangle shows considerable effectiveness due to • a solution process that is nearly complete • identification of most of the important elements of the problem • a considerable understanding of the relationships between important elements of the problem • appropriate conclusions with supporting evidence
40	Problem-solving process to determine the area of the unshaded part of the rectangle shows a high degree of effectiveness due to • a complete solution process • identification of all important elements of the problem • a thorough understanding of the relationships between all of the important elements of the problem • appropriate conclusions with thorough and insightful supporting evidence

Scoring Guide for Junior Mathematics Open-Response
Question 10

Code 10

Determine the area of the unshaded part of the rectangle below. Use a ruler.



Justify your answer.

$A = L \times W$ $A = L \times W$ $A = L \times W$
$= 4 \times 4$ $= 16 \times 6$ $= 3 \times 3$
$= 16$ $= 96$ $= 9$

$16 + 96 + 9 = 121 cm^2$

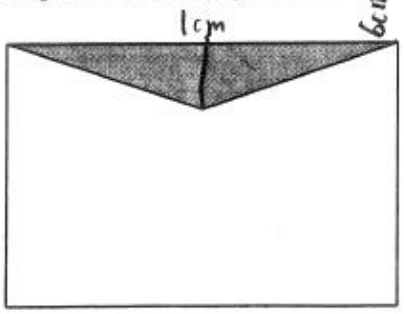
The area of the unshaded part of the rectangle is $121 cm^2$.

Annotation:
Student shows limited effectiveness by placing too much emphasis on unimportant elements of the problem; accurately measures side lengths of unshaded shape and then inappropriately multiples to determine area.

Scoring Guide for Junior Mathematics Open-Response Question 10

Code 20

Determine the area of the unshaded part of the rectangle below. Use a ruler.



Justify your answer.

I think the area of the shaded part is 3 cm^3
I think this because when I mesured the true hight it was 1 cm and the length is 6 cm so I did $A = (L \times w) \div 2$
$= (1 \times 6) \div 2$
$= 6 \div 2$
$= 3 cm^3$
so there for the unshaded part is 3 cm^3

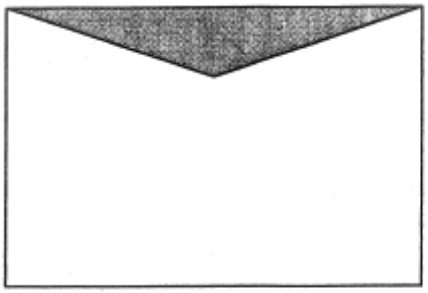
The area of the unshaded part of the rectangle is 3 cm^3.

Annotation:
Student provides an incomplete solution process; measures height and base of shaded triangle accurately and calculates area, but does not calculate the area of the larger unshaded rectangle or subtract the area of the shaded triangle.

Scoring Guide for Junior Mathematics Open-Response Question 10

Code 30

Determine the area of the unshaded part of the rectangle below. Use a ruler.



Justify your answer.

shaded Area = B x H = 6 x 1 = 6

unshaded Area = L x W = 6 x 4 - 6 = 18

The area of the unshaded part of the rectangle is 18 square units.

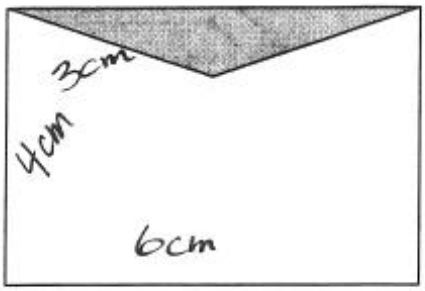
Annotation:

Student demonstrates a considerable understanding of the relationships between important elements of the problem; measures required lengths accurately; calculates area of the triangle but does not divide by 2; subtracts this from the area of the rectangle to determine the shaded area.

Scoring Guide for Junior Mathematics Open-Response Question 10

Code 40

Determine the area of the unshaded part of the rectangle below. Use a ruler.



Justify your answer.

$4cm \times 6cm = 24cm^2$

$1cm \times 6cm = 6cm \div 2 = 3cm^2$

$24cm^2 - 3cm^2 = 21cm^2$

First I calculated the area of the whole rectangle then calculated the shaded part's area. Then subtracted the results from both and got the answer.

The area of the unshaded part of the rectangle is $21cm^2$.

Annotation:
Student demonstrates a complete solution process; required lengths are measured accurately (3 cm diagonal side should be 3.2 cm but this measurement is not used in area calculation); area of the shaded triangle is correctly calculated and subtracted from the area of the large rectangle.

Scoring Guide for Junior Mathematics Open-Response Question 26

Code	Descriptor
B	• Blank: nothing written or drawn in response to the question
I	• Illegible: cannot be read; completely crossed out/erased; not written in English • Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • Off topic: no relationship of written work to the question
10	Problem-solving process to use a table of values to determine the day when Anne will place 1024 pennies in her jar shows limited effectiveness due to • minimal evidence of a solution process • limited identification of important elements of the problem • too much emphasis on unimportant elements of the problem • no conclusions presented • conclusion presented without supporting evidence
20	Problem-solving process to use a table of values to determine the day when Anne will place 1024 pennies in her jar shows some effectiveness due to • an incomplete solution process • identification of some of the important elements of the problem • some understanding of the relationships between important elements of the problem • simple conclusions with little supporting evidence
30	Problem-solving process to use a table of values to determine the day when Anne will place 1024 pennies in her jar shows considerable effectiveness due to • a solution process that is nearly complete • identification of most of the important elements of the problem • a considerable understanding of the relationships between important elements of the problem • appropriate conclusions with supporting evidence
40	Problem-solving process to use a table of values to determine the day when Anne will place 1024 pennies in her jar shows a high degree of effectiveness due to • a complete solution process • identification of all important elements of the problem • a thorough understanding of the relationships between all of the important elements of the problem • appropriate conclusions with thorough and insightful supporting evidence

Scoring Guide for Junior Mathematics Open-Response Question 26

Code 10

The table below shows the number of pennies Anne places in a jar each day.

The pattern continues. Complete the table for Days 5 and 6.

Anne's Jar

Day	Number of pennies placed in the jar
1	1
2	2
3	4
4	8
5	
6	

On what day will Anne place 1024 pennies in her jar?

Justify your answer.

Anne will place the 1024th penny in her jar on the 512th day. I know because each number in the pattern is multipling itself by 2. So 512x2=1024 pennies.

Anne will place 1024 pennies in her jar on Day 512.

Annotation:

Student demonstrates minimal evidence of a solution process; does not complete the pattern in the table and shows little evidence of understanding the pattern; pattern rule is inaccurate and leads to incorrect conclusion of Day 512.

Scoring Guide for Junior Mathematics Open-Response Question 26

Code 20

The table below shows the number of pennies Anne places in a jar each day.

The pattern continues. Complete the table for Days 5 and 6.

Anne's Jar

Day	Number of pennies placed in the jar
1	1
2	2
3	4
4	8
5	16
6	32

On what day will Anne place 1024 pennies in her jar?

Justify your answer.

She will place 1024 pennies in her jar on day 32 because

$$\begin{array}{r} 32 \\ \times\ 32 \\ \hline 64 \\ +960 \\ \hline 1024 \end{array}$$

Anne will place 1024 pennies in her jar on Day 32.

Annotation:

Student demonstrates some understanding of the relationships between important elements of the problem; accurately completes the pattern in the table; incorrectly identifies the pattern rule, therefore being unable to extend the pattern; student arrives at an incorrect conclusion.

Scoring Guide for Junior Mathematics Open-Response Question 26

Code 30

The table below shows the number of pennies Anne places in a jar each day.

The pattern continues. Complete the table for Days 5 and 6.

Anne's Jar

Day	Number of pennies placed in the jar
1	1 x 2
2	2 x 2
3	4 x 2
4	8
5	16 x 2
6	32

On what day will Anne place 1024 pennies in her jar?

Justify your answer.

rule: x previous # by 2

1024 ÷ 2 = 512 Day 10

512 ÷ 2 = 256 Day 9

256 ÷ 2 = 128 Day 8

128 ÷ 2 = 64 Day 7

64 ÷ 2 = 32 (6)

put in 32 on day 6

count backwards

Anne will place 1024 pennies in her jar on Day 10.

Annotation:

Student demonstrates a solution process that is nearly complete; accurately completes the pattern in the table and extends the pattern through the division process; minor error in calculating the number of days (not counting the last day) leads to an incorrect conclusion.

Scoring Guide for Junior Mathematics Open-Response Question 26

Code 40

The table below shows the number of pennies Anne places in a jar each day.

The pattern continues. Complete the table for Days 5 and 6.

Anne's Jar

Day	Number of pennies placed in the jar
1	1
2	2
3	4
4	8
5	16
6	32

On what day will Anne place 1024 pennies in her jar?

Justify your answer.

Day:	Pennies:
7	64
8	128
9	256
10	512
11	1024

Anne will place 1024 pennies in her jar on Day 11.

Annotation:

Student demonstrates a thorough understanding of the relationships between all of the important elements of the problem; accurately completes the pattern in the table and is able to use the pattern to extend the number of pennies to the 1024 and arrive at Day 11.

Scoring Guide for Junior Mathematics Open-Response Question 27

Code	Descriptor
B	• Blank: nothing written or drawn in response to the question
I	• Illegible: cannot be read; completely crossed out/erased; not written in English • Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • Off topic: no relationship of written work to the question
10	Problem-solving process to predict the frequency of selecting a card with a vowel in 500 selections shows limited effectiveness due to • minimal evidence of a solution process • limited identification of important elements of the problem • too much emphasis on unimportant elements of the problem • no conclusions presented • conclusion presented without supporting evidence
20	Problem-solving process to predict the frequency of selecting a card with a vowel in 500 selections shows some effectiveness due to • an incomplete solution process • identification of some of the important elements of the problem • some understanding of the relationships between important elements of the problem • simple conclusions with little supporting evidence
30	Problem-solving process to predict the frequency of selecting a card with a vowel in 500 selections shows considerable effectiveness due to • a solution process that is nearly complete • identification of most of the important elements of the problem • a considerable understanding of the relationships between important elements of the problem • appropriate conclusions with supporting evidence
40	Problem-solving process to predict the frequency of selecting a card with a vowel in 500 selections shows a high degree of effectiveness due to • a complete solution process • identification of all important elements of the problem • a thorough understanding of the relationships between all of the important elements of the problem • appropriate conclusions with thorough and insightful supporting evidence

Scoring Guide for Junior Mathematics Open-Response Question 27

Code 10

Farzad puts the following 10 cards into a bag.

Farzad randomly selects one card, records the result and puts the card back into the bag. If he does this 500 times, how many times is it likely that he will select a card with a vowel (A, E, I, O, U)?

Justify your answer. Farzad should draw a vowel 166.666...

because $500 \div 3 = 166.666...$

Annotation:
Student demonstrates minimal evidence of a solution process; inappropriately attempts to deal with 500 selections and the likelihood of choosing a vowel by dividing 500 by 3.

Scoring Guide for Junior Mathematics Open-Response Question 27

Code 20

Farzad puts the following 10 cards into a bag.

Farzad randomly selects one card, records the result and puts the card back into the bag. If he does this 500 times, how many times is it likely that he will select a card with a vowel (A, E, I, O, U)?

Justify your answer. It is $\frac{3}{10}$ that he would likely pick out a vowel

3 vowels out of ten letters

vowel vowel vowel

ASSESSMENT $\frac{3}{10}$

Annotation:
Student demonstrates an incomplete solution process; determines the chance of selecting a vowel; does not deal with the number of times out of 500.

Scoring Guide for Junior Mathematics Open-Response Question 27

Code 30

Farzad puts the following 10 cards into a bag.

Farzad randomly selects one card, records the result and puts the card back into the bag. If he does this 500 times, how many times is it likely that he will select a card with a vowel (A, E, I, O, U)?

Justify your answer.

10 cards 2 are vowels

$\times \frac{10}{50}$ $\times \frac{2}{50}$ so he will likely pick

$\frac{}{500}$ $\frac{}{100}$

a card that is a vowel

100 time out of 500.

Annotation:
Student demonstrates a considerable understanding of the relationships between important elements of the problem; determines the number of times it is likely for each card to be chosen (50) and multiplies by 2 (either misses second E or does not count the 2 E's as 2 vowels).

Scoring Guide for Junior Mathematics Open-Response Question 27

Code 40

Farzad puts the following 10 cards into a bag.

Farzad randomly selects one card, records the result and puts the card back into the bag. If he does this 500 times, how many times is it likely that he will select a card with a vowel (A, E, I, O, U)?

Justify your answer.

$\frac{3}{10} = \frac{30}{100} = 30\% = \frac{150}{500}$

Farzad's possibility of getting a vowel is 150 times.

Annotation:
Student demonstrates a complete solution process; determines the chance of selecting a vowel and uses equivalent fractions to determine the number of times Farzad is likely to select a vowel.

Scoring Guide for Junior Mathematics Open-Response Question 28

Code	Descriptor
B	• Blank: nothing written or drawn in response to the question
I	• Illegible: cannot be read; completely crossed out/erased; not written in English • Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • Off topic: no relationship of written work to the question
10	Problem-solving process to determine the company offering the lowest rate shows limited effectiveness due to • minimal evidence of a solution process • limited identification of important elements of the problem • too much emphasis on unimportant elements of the problem • no conclusions presented • conclusion presented without supporting evidence
20	Problem-solving process to determine the company offering the lowest rate shows some effectiveness due to • an incomplete solution process • identification of some of the important elements of the problem • some understanding of the relationships between important elements of the problem • simple conclusions with little supporting evidence
30	Problem-solving process to determine the company offering the lowest rate shows considerable effectiveness due to • a solution process that is nearly complete • identification of most of the important elements of the problem • a considerable understanding of the relationships between important elements of the problem • appropriate conclusions with supporting evidence
40	Problem-solving process to determine the company offering the lowest rate shows a high degree of effectiveness due to • a complete solution process • identification of all important elements of the problem • a thorough understanding of the relationships between all of the important elements of the problem • appropriate conclusions with thorough and insightful supporting evidence

Scoring Guide for Junior Mathematics Open-Response Question 28

Code 10

The rates for Internet use offered by three companies are shown below.

- Company A: $6.00 for every 90 minutes of use
- Company B: $2.75 for every 45 minutes of use
- Company C: $3.00 for every 60 minutes of use

Which company offers the lowest rate per minute?

Show your work.

$2.75 (less) per 45 mins of use.
$3.00 (most) per 60 mins of use
$6.00 per 90 mins of use
$2.75 is the lowest Rate.

Company B offers the lowest rate per minute.

Annotation:
Student demonstrates minimal evidence of a solution process; repeats elements of the question without solving the problem; chooses Company B with no supporting evidence.

Scoring Guide for Junior Mathematics Open-Response Question 28

Code 20

The rates for Internet use offered by three companies are shown below.

- Company A: $6.00 for every 90 minutes of use
- Company B: $2.75 for every 45 minutes of use
- Company C: $3.00 for every 60 minutes of use

Which company offers the lowest rate per minute?

Show your work.

Into
- comA = 6.00 (90 min)
- com. B = 2.75 ¢
- com C = 3.00 60 min

(1) a) 90 min : 6¢ = 15¢ per min
b) 45 ÷ $2.75 = 16¢ per min
c) 60 ÷ $3.00 = 20¢ per min

(2) Com. A = lowest rate at 15¢
Com. B = second lowest at 16¢
Com. C = Highest rate at 20¢

(3) Company A offers the lowest rate per minute because it is only 15¢ whereas the others are over.

Company A offers the lowest rate per minute.

Annotation:
Student demonstrates some understanding of the relationships between important elements of the problem; sets up and calculates minutes per dollar but calls them cents per minute and chooses the least instead of the greatest.

Scoring Guide for Junior Mathematics Open-Response Question 28

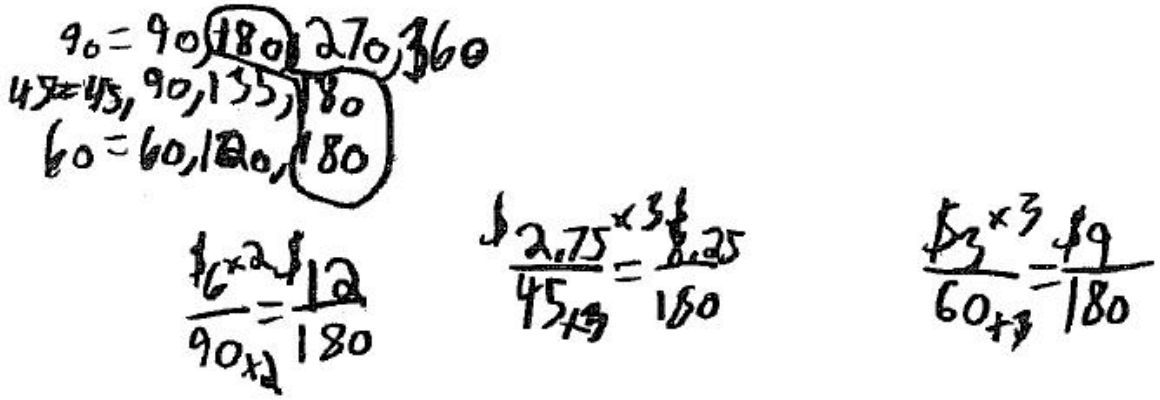
Code 30

The rates for Internet use offered by three companies are shown below.

- Company A: $6.00 for every 90 minutes of use
- Company B: $2.75 for every 45 minutes of use
- Company C: $3.00 for every 60 minutes of use

Which company offers the lowest rate per minute?

Show your work.



Company B offers the lowest rate per minute.

Annotation:
Student demonstrates considerable understanding of the relationships between important elements of the problem; calculates and compares the cost for 180 minutes at each company but multiplies by 3 instead of 4 for Company B; conclusion matches calculations.

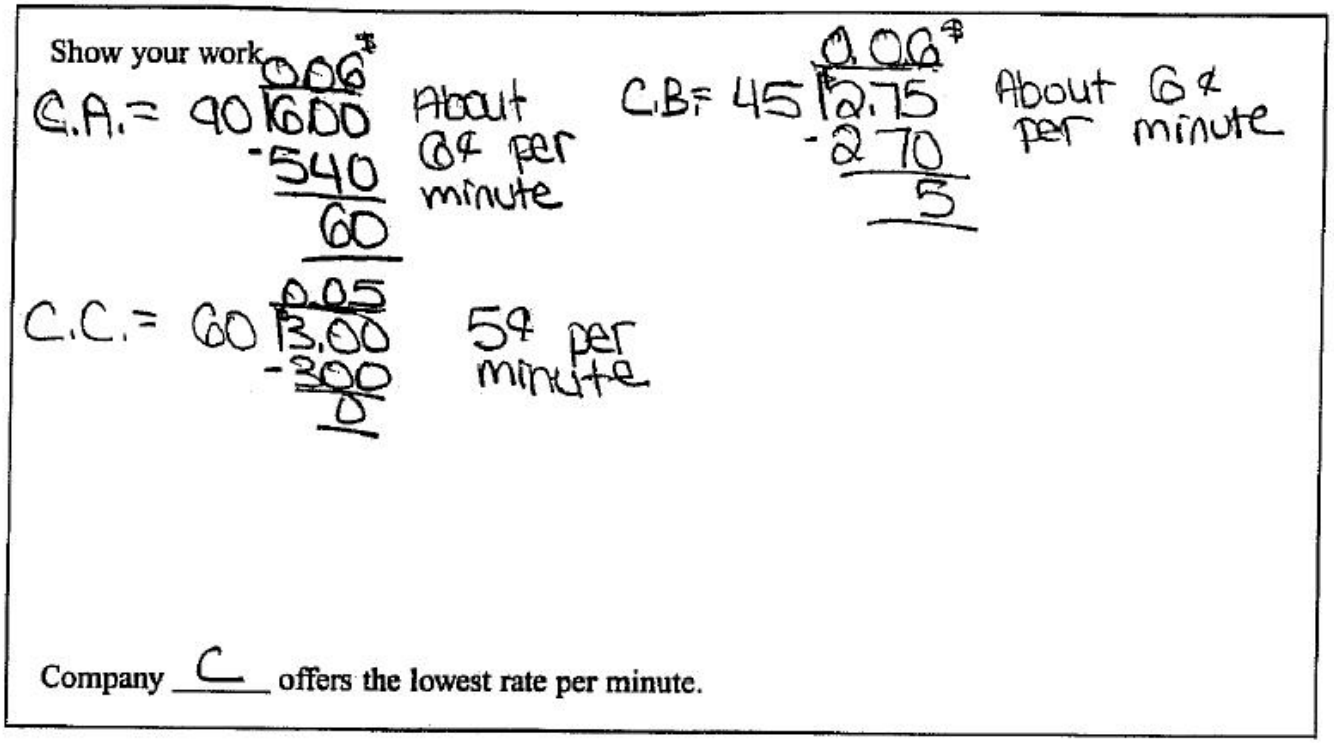
Scoring Guide for Junior Mathematics Open-Response Question 28

Code 40

The rates for Internet use offered by three companies are shown below.

- Company A: $6.00 for every 90 minutes of use
- Company B: $2.75 for every 45 minutes of use
- Company C: $3.00 for every 60 minutes of use

Which company offers the lowest rate per minute?



Annotation:
Student demonstrates a thorough understanding of the relationships between all of the important elements of the problem; calculates the rates per minute for each company and uses the rates to make the correct conclusion (Company C).

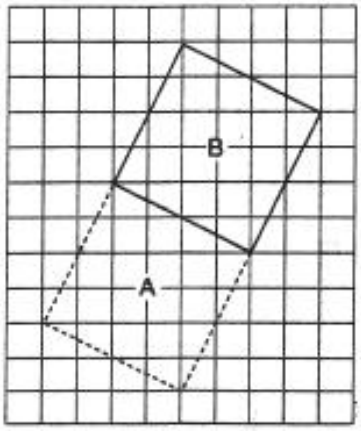
Scoring Guide for Junior Mathematics Open-Response Question 29

Code	Descriptor
B	• Blank: nothing written or drawn in response to the question
I	• Illegible: cannot be read; completely crossed out/erased; not written in English • Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, "?", "!", "I don't know") • Off topic: no relationship of written work to the question
10	Problem-solving process to analyse a drawing by describing three different transformations shows limited effectiveness due to • minimal evidence of a solution process • limited identification of important elements of the problem • too much emphasis on unimportant elements of the problem • no conclusions presented • conclusion presented without supporting evidence
20	Problem-solving process to analyse a drawing by describing three different transformations shows some effectiveness due to • an incomplete solution process • identification of some of the important elements of the problem • some understanding of the relationships between important elements of the problem • simple conclusions with little supporting evidence
30	Problem-solving process to analyse a drawing by describing three different transformations shows considerable effectiveness due to • a solution process that is nearly complete • identification of most of the important elements of the problem • a considerable understanding of the relationships between important elements of the problem • appropriate conclusions with supporting evidence
40	Problem-solving process to analyse a drawing by describing three different transformations shows a high degree of effectiveness due to • a complete solution process • identification of all important elements of the problem • a thorough understanding of the relationships between all of the important elements of the problem • appropriate conclusions with thorough and insightful supporting evidence

Scoring Guide for Junior Mathematics Open-Response
Question 29

Code 10

The diagram below shows a square that was moved by a transformation from position A to position B.



Describe three different ways to move the square from position A to position B. Each way should use a different type of transformation. Remember to include the mirror lines or the centre of rotation on the grid.

Complete the following chart.

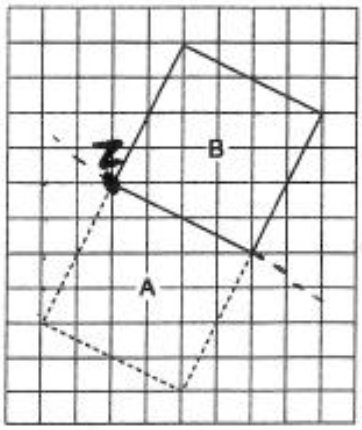
Type of Transformation	Description
Slide	When we used a slide to transfer the object to a different place we slide the shape across the paper.
Flip	When we used a flip to transfer the shape we picked the shape up and fliped it onto its other side
Reflection	When we used a reflection we reflected the shape to a different place & Area on the grid paper.

Annotation:
Student demonstrates a limited identification of important elements of the problem; names 2 different transformations, with inaccurate descriptions.

Scoring Guide for Junior Mathematics Open-Response
Question 29

Code 20

The diagram below shows a square that was moved by a transformation from position A to position B.



Describe three different ways to move the square from position A to position B. Each way should use a different type of transformation. Remember to include the mirror lines or the centre of rotation on the grid.

Complete the following chart.

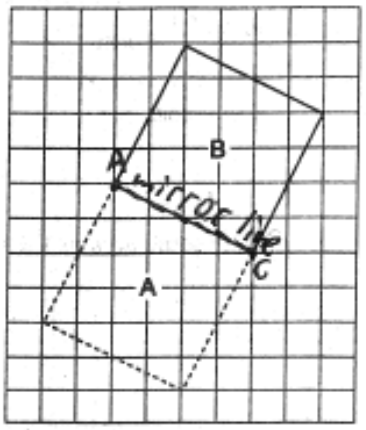
Type of Transformation	Description
Reflection	Square A could have been reflected to B
Translation	3 up, 2 right
Rotation	A could have been rotated from Z

Annotation:
Student demonstrates some understanding of the relationships between the important elements of the problem; names 3 different transformations with mirror line identified and correct centre of rotation. Note: the number of units up are incorrect for translation and missing the size of the rotation.

Scoring Guide for Junior Mathematics Open-Response
Question 29

Code 30

The diagram below shows a square that was moved by a transformation from position A to position B.



Describe three different ways to move the square from position A to position B. Each way should use a different type of transformation. Remember to include the mirror lines or the centre of rotation on the grid.

Complete the following chart.

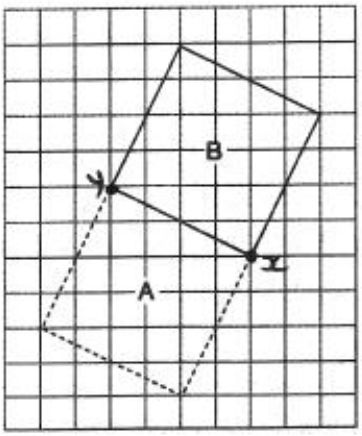
Type of Transformation	Description
Transition	2R, 4U
Rotation	Rotate $\frac{3}{4}$ about point A
Reflection	Reflect on mirror line or line segement AC.

Annotation:
Student demonstrates considerable understanding of the relationships between the important elements of the problem; names 3 different transformations with units for the translation ("transition") and mirror line for the reflection and centre of rotation for the rotation. Note: incorrect size of the turn.

Scoring Guide for Junior Mathematics Open-Response Question 29

Code 40

The diagram below shows a square that was moved by a transformation from position A to position B.



Describe three different ways to move the square from position A to position B. Each way should use a different type of transformation. Remember to include the mirror lines or the centre of rotation on the grid.

Complete the following chart.

Type of Transformation	Description
rotation	The rotation is 270° around a point y in a clockwise direction.
reflection	Reflect the shape over line $\overline{yx}$.
slide	Slide the shape 4 units up and 2 units to the right.

Annotation:
Student demonstrates a complete solution process; describes three different transformations that move the square and provides centre of rotation, direction and size of turn and mirror line (line yx) and units for the translation.