Education Quality and Accountability Office

EQAO

Grade 9 Assessment of Mathematics

Winter 2008, Applied

Released Item-Specific Rubrics and Sample Student Responses with Annotations

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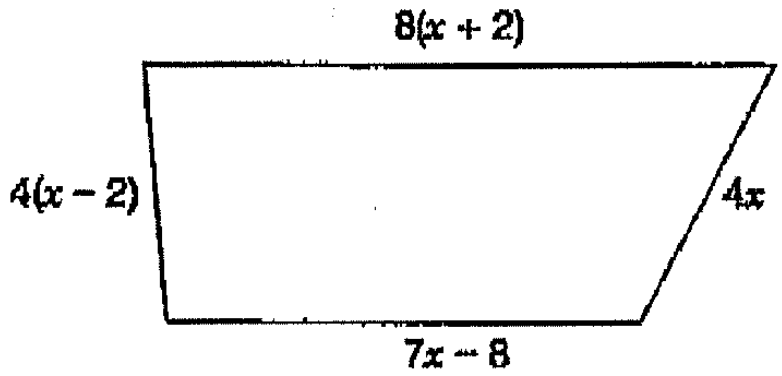
Assessment of Mathematics
Grade 9 Applied Program
Specific Open-Response Scoring Guide

Field Maintenance (Winter 2008)

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 solve first-degree equations shows limited effectiveness due to ● misunderstanding of concepts; ● incorrect selection or misuse of procedures.
20	Application of knowledge and skills to solve first-degree equations 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 solve first-degree equations 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 solve first-degree equations 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)

Anchor - Code 10
Applied Winter (Question 7) Name of item: Field Maintenance



$4x - 2$

Determine the length of fencing needed for each side of the field.

Show your work.

$4x-2+7x-8+4x+8x+2$

$= 4x-2+2+7x-8+8+4x+8x+2-2$

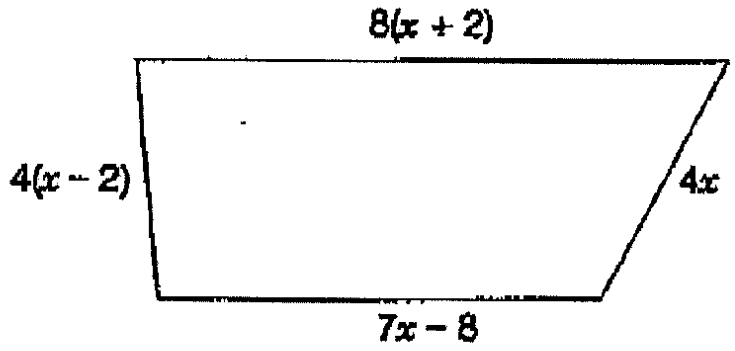
$= 4x+7x+4x+8x = 2+8+2$

$= 23x = 12$

$\frac{23x}{23} = \frac{23}{12} = 1.92$

Annotation:
Student demonstrates a misuse of procedures; incorrect development of algebraic equation with several errors.

Anchor - Code 20
Applied Winter (Question 7) Name of item: Field Maintenance



Determine the length of fencing needed for each side of the field.

Show your work.

$P = 460$

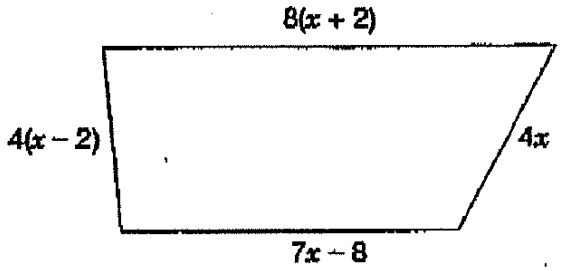
$P = 8x + 16 + 4x + 7x - 8 + 4x - 8$

$460 = 23x + 16 + 8 - 8$

$460 = 23x$

Annotation:
Student demonstrates a partial understanding of the concepts; determines the appropriate equation and shows the correct algebraic work. Does not solve for *x* or determine the length of the sides of the field.

Anchor - Code 30
Applied Winter (Question 7) Name of item: Field Maintenance



Determine the length of fencing needed for each side of the field.

Show your work.

$P = a + b + c$

$460 = 8(x+2)\ 4(x-2)\ 7x-8\ 4x$

$460 = 8x + 16\ 4x - 8\ 7x - 84x$

$460 = 23x + 32$

$460 - 32 = 32 - 32 + 23x$

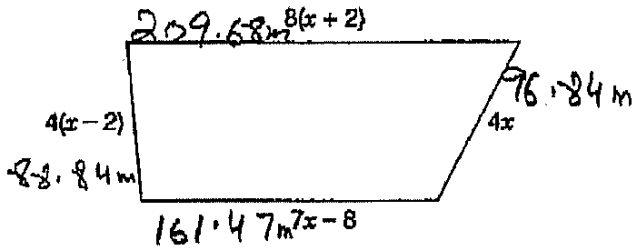
$\frac{437}{23} = \frac{23x}{23}$

$x = 19\ m^2$

You'll need $19m^2$ of fencing to go around the feild.

Annotation:
Student demonstrates a minor error and omission in the application of the procedures; determines x correctly with minor error in the collection of the constants, lengths of the sides of the field are not determined. Minor error in subtraction does not detract from an understanding of the algebraic concepts.

Anchor - Code 40
Applied Winter (Question 7) Name of item: Field Maintenance



Determine the length of fencing needed for each side of the field.

Show your work.

$8(x+2) + (4x) + (7x-8) + 4(x-2) = 460\text{ m}$

$8x + 16 + 4x + 7x - 8 + 4x - 8 = 460\text{ m}$

$8x + 4x + 7x + 4x + 16 - 8 - 8 = 460\text{ m}$

$19x + 0 = 460\text{ m}$

$\frac{19x}{19} = \frac{460\text{m}}{19}$ 24.21 m

$x = 24.21\text{m}$

① $8(x+2)$
$= 8(24.21 + 2)$
$= 8(26.21)$
$= 209.68\text{m}$

② $4x$
$= 4(24.21)$
$= 96.84\text{m}$

③ $7x - 8$
$= 7(24.21) - 8$
$= 169.47 - 8$
$= 161.47\text{m}$

$4(x-2)$
$= 4(24.21 - 2)$
$= 4(22.21)$
$= 88.84\text{m}$

Annotation:
Student demonstrates an accurate application of the procedures; shows work in determining x and the side lengths. Minor arithmetic error in determining the coefficient of x does not detract from the demonstration of a thorough understanding.

Assessment of Mathematics
Grade 9 Applied Program
Specific Open-Response Scoring Guide

Makin' a Profit (Winter 2008)

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 complete the table of values and graph these data shows limited effectiveness due to ● misunderstanding of concepts; ● incorrect selection or misuse of procedures.
20	Application of knowledge and skills to complete the table of values and graph these data 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 complete the table of values and graph these data 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 complete the table of values and graph these data 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)

Anchor - Code 10
Applied Winter (Question 15) Name of item: Makin' a Profit

Student council is planning a dance.

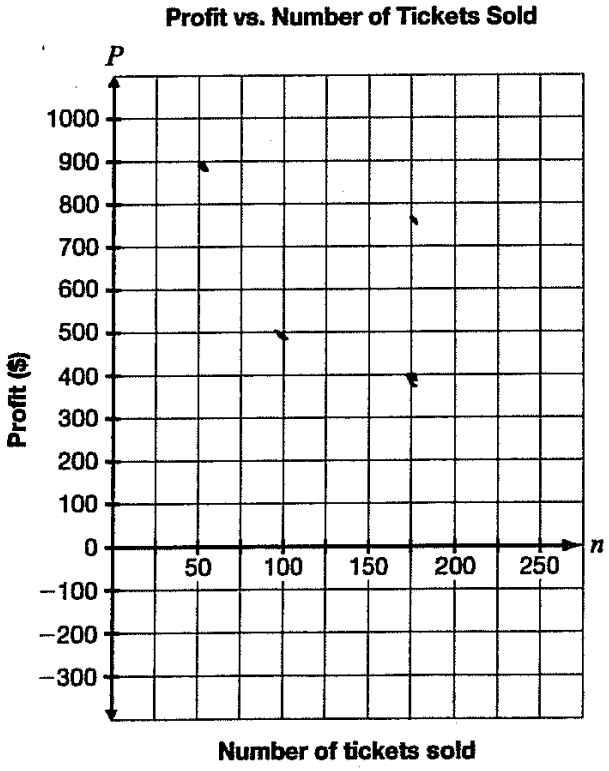
- The cost to hire a DJ is $300.
- Tickets are sold at $6 each.
- The profit is based on the amount received from the tickets sold minus the cost of the DJ.

Complete the table of values to show the profit based on the number of tickets sold.

Profit from Ticket Sales

Number of tickets sold	Profit ($)
0	0
50	20
100	30
150	46
200	50

Graph these data on the grid below.



Annotation:
Student demonstrates a misunderstanding of the concepts; table of values incorrect as does not recognize increase of $300 for every 50 tickets and errors in plotting points.

Anchor - Code 20
Applied Winter (Question 15) Name of item: Makin' a Profit

Student council is planning a dance.

- The cost to hire a DJ is $300.
- Tickets are sold at $6 each.
- The profit is based on the amount received from the tickets sold minus the cost of the DJ.

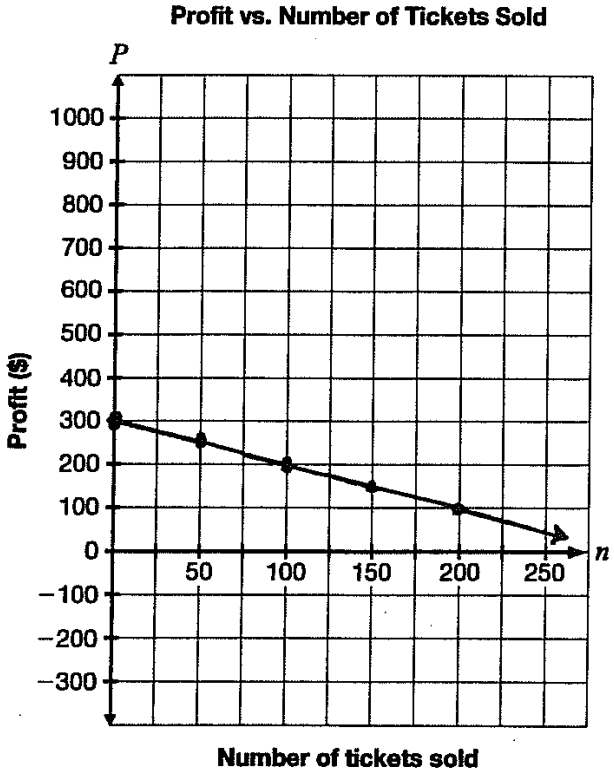
Complete the table of values to show the profit based on the number of tickets sold.

Profit from Ticket Sales

Number of tickets sold	Profit ($)
0	-300
50	250
100	200
150	150
200	100

Profit
cost of DJ → $300 − Number of Sold

Graph these data on the grid below.



Annotation:
Student demonstrates errors and/or omissions in the application of the procedures; table of values not completed correctly for this scenario as does not use $300 increase for every 50 tickets sold but plots points correctly according to the table of values (line not considered).

Anchor - Code 30
Applied Winter (Question 15) Name of item: Makin' a Profit

Student council is planning a dance.

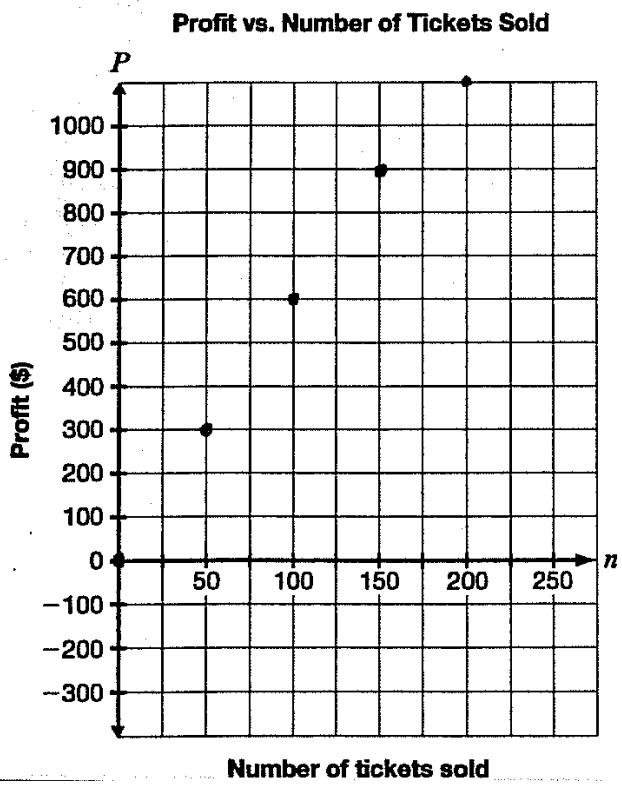
- The cost to hire a DJ is $300.
- Tickets are sold at $6 each.
- The profit is based on the amount received from the tickets sold minus the cost of the DJ.

Complete the table of values to show the profit based on the number of tickets sold.

Profit from Ticket Sales

Number of tickets sold	Profit ($)
0	$0
50	6 x 50 = 300
100	6 x 100 = 600
150	6 x 150 = 900
200	6 x 200 = 1200

Graph these data on the grid below.



Annotation:
Student demonstrates an understanding of most of the concepts; $300 DJ cost not considered as part of profit in the table of values but demonstrates understanding of the rate of increase of $300 per 50 tickets, and all points plotted correctly except the last one as graph does not extend to 1200 (this point may be missed on graph or graphed incorrectly).

Anchor - Code 40
Applied Winter (Question 15) Name of item: Makin' a Profit

Student council is planning a dance.

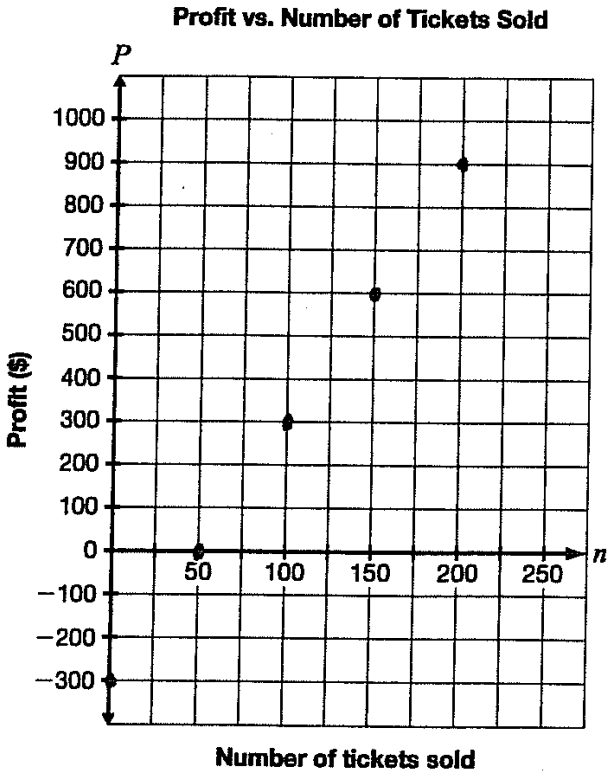
- The cost to hire a DJ is $300.
- Tickets are sold at $6 each.
- The profit is based on the amount received from the tickets sold minus the cost of the DJ.

Complete the table of values to show the profit based on the number of tickets sold.

Profit from Ticket Sales

Number of tickets sold	Profit ($)
0	6X0-300 = -300
50	6X50-300 = 0
100	6x100=300= 300
150	6X150-300= 600
200	6x200-300 = 900

Graph these data on the grid below.



Annotation:
Student demonstrates an accurate application of the procedures; all the values in the table are correct and all the points are plotted correctly on the graph to match the table.

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Rockin' Radicals (Winter 2008)

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 determine the amount of the signing bonus and the amount they receive per CD shows limited effectiveness due to ● misunderstanding of concepts; ● incorrect selection or misuse of procedures.
20	Application of knowledge and skills to determine the amount of the signing bonus and the amount they receive per CD 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 determine the amount of the signing bonus and the amount they receive per CD 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 determine the amount of the signing bonus and the amount they receive per CD 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) (e.g., $10 000 signing bonus and $0.12 per CD)

Anchor - Code 10
Applied Winter (Question 16) Name of item: Rockin' Radicals

The Radicals, a small high school band, recently signed a contract with a record label. Their earnings include a signing bonus plus an amount per CD sold, as shown in the table below.

Number of CDs	Band earnings ($)
0	10 000
5 000	10 600
10 000	11 200
15 000	11 800
20 000	12 400

Determine the amount of the signing bonus and the amount they receive per CD.

Show your work.

The total amount of cd's = 50,000 cds

Total Band earnings = $56,000

$\frac{50,000}{56,000} = 112\% \div 2 = 56$

The amount of the signing bonus = $56

" " " they receive per CD = $56

Annotation:
Student demonstrates a misunderstanding of the concepts; determines the signing bonus and amount per CD incorrectly and calculations demonstrate a misunderstanding of the concepts (not a direct variation).

Anchor - Code 20

Applied Winter (Question 16) Name of item: Rockin' Radicals

The Radicals, a small high school band, recently signed a contract with a record label. Their earnings include a signing bonus plus an amount per CD sold, as shown in the table below.

Number of CDs	Band earnings ($)
0	10 000
5 000	10 600
10 000	11 200
15 000	11 800
20 000	12 400

+5000 +5000 +5000 +600 +600 +600 +600

Determine the amount of the signing bonus and the amount they receive per CD.

Show your work.

per every 5 000 cd's the band earns 600$ more.

Annotation:
Student demonstrates omissions in the application of procedures; determines a rate of earning but does not determine the amount of the signing bonus or the rate per CD.

Anchor - Code 30

Applied Winter (Question 16) Name of item: Rockin' Radicals

The Radicals, a small high school band, recently signed a contract with a record label. Their earnings include a signing bonus plus an amount per CD sold, as shown in the table below.

Number of CDs	Band earnings ($)
0	10 000
5 000	10 600
10 000	11 200
15 000	11 800
20 000	12 400

Determine the amount of the signing bonus and the amount they receive per CD.

Show your work.

Okay so looking at the table I see that the signing bonus is $10 000 because with zero cd's sold there is $10 000 in the band earning's column.

Then you go to 5 000 cd's sold.
you take the band earning's
10 600 subtract signing bonus

$$\begin{array}{r} 10\,600 \\ -\,10\,000 \\ \hline 600 \end{array}$$

and $600 was made from cd sales.

Then $5\,000 \div 600 = 8.333333333$.

So they recieve 10 000 signing bonus and approx 8.33 per cd sold.

Annotation:
Student demonstrates a minor error in the application of the procedures; determines the signing bonus correctly and demonstrates an understanding of the amount per CD, with a minor calculation error (divided 5000/600 instead of 600/5000).

Anchor - Code 40
Applied Winter (Question 16) Name of item: Rockin' Radicals

The Radicals, a small high school band, recently signed a contract with a record label. Their earnings include a signing bonus plus an amount per CD sold, as shown in the table below.

Number of CDs	Band earnings ($)
0	10 000
5 000	10 600
10 000	11 200
15 000	11 800
20 000	12 400

Determine the amount of the signing bonus and the amount they receive per CD.

Show your work.

Signing bonus is 10 000

The band makes $.12 for every cd sold.

$\frac{600}{5000} = .12$

Annotation:
Student demonstrates a thorough understanding of the concepts; determines the amount of the signing bonus and the amount per CD with calculations shown.

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Paint (Winter 2008)

Code	Descriptor
B	Blank: nothing written or drawn in response to the question
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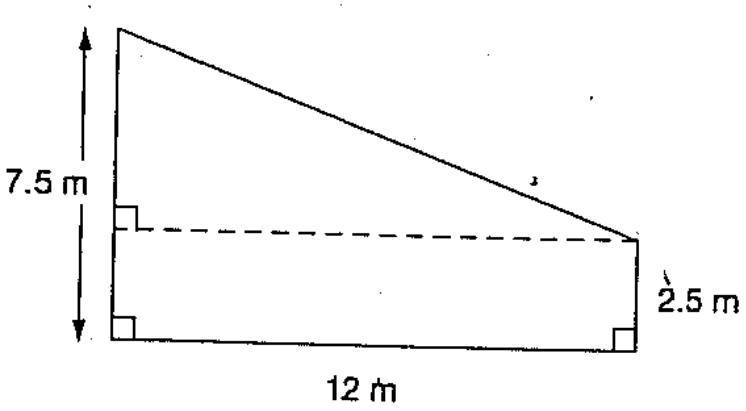
10	Problem-solving process in solving problems involving the area of a composite shape shows limited effectiveness due to • minimal evidence of a solution process; • limited identification of important elements of the problem; • too much emphasis on unimportant elements of the problem; • no conclusions presented or conclusion presented without supporting evidence.
20	Problem-solving process in solving problems involving the area of a composite shape 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 in solving problems involving the area of a composite shape 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 in solving problems involving the area of a composite shape 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. (e.g., 7 L of paint)

Anchor - Code 10
Applied Winter (Question 21) Name of item: Paint

Jackson is buying paint for his wall.



One litre of paint will cover 9 m^2.

How many litres of paint does he need to cover the wall?

Justify your answer.

P = l x w

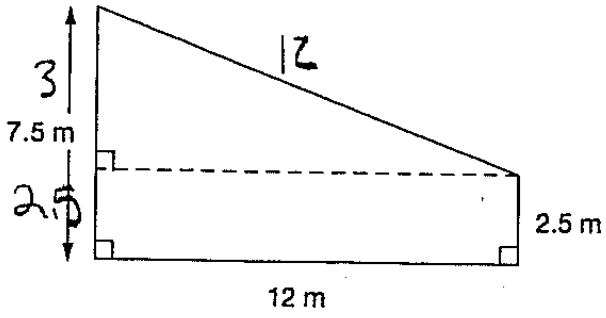
12 x 2.5

= 30

Annotation:
Problem solving process demonstrates minimal evidence of a solution process; calculates area of rectangular part of the figure only.

Anchor - Code 20
Applied Winter (Question 21) Name of item: Paint

Jackson is buying paint for his wall.



One litre of paint will cover 9 m^2.

How many litres of paint does he need to cover the wall?

Justify your answer.

bottom $P = 2(l + w)$

$P = 12 + 2.5 + 2.5 \div 2 = 15.75$

Top $P = 3 + 12 + 12 \div 2 = 5$ $15.75 + 5 = 20$

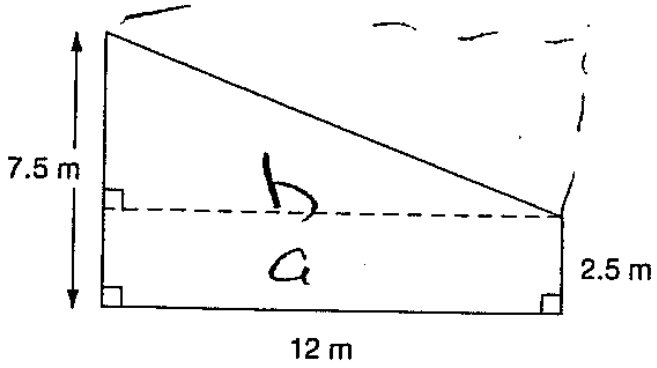
$\frac{20}{9} = 2.2$

he would need 2.2 cans of paint to paint the wall.

Annotation:
Problem solving process demonstrates identification of some of the important elements of the problem; considers two parts of the figure and appears to determine the perimeters instead of the areas and divides the total by 9 to determine the number of litres of paint required.

Anchor - Code 30
Applied Winter (Question 21) Name of item: Paint

Jackson is buying paint for his wall.



7.5
−2.5
5.0

One litre of paint will cover 9 m^2.

How many litres of paint does he need to cover the wall?

Justify your answer.

a = 12
×2.5
30

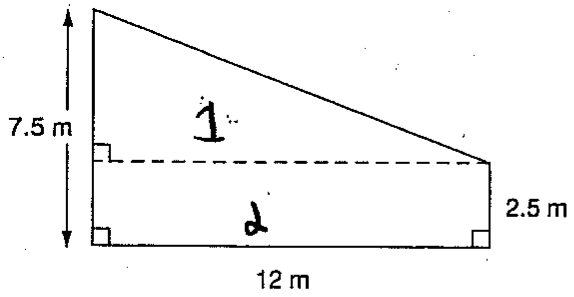
b = 12
×5.0
60 = 30
2

30
+30
60

Annotation:
Problem solving process demonstrates a solution process that is nearly complete; considers the two parts of the figure and calculates the area of the wall accurately, but does not divide by 9 to determine the amount of paint required.

Anchor - Code 40
Applied Winter (Question 21) Name of item: Paint

Jackson is buying paint for his wall.



One litre of paint will cover 9 m^2.

How many litres of paint does he need to cover the wall?

Justify your answer.

$A_1 = \frac{bh}{2}$ & $A_2 = lw$

$= \frac{12(7.5-2.5)}{2}$ $= 12(2.5)$

$= \frac{12(5)}{2}$ $= 30\ m^2$

$= 60 \div 2$ $A_{total} = A_1 + A_2$

$= 30\ m^2$ $= 30 + 30$

$= 60\ m^2$.

$\frac{60}{9} \approx 6.67 L$

∴ He will need approximately 6.67 litres of paint to cover the wall (rounded to the nearest hundredth).

Annotation:
Problem solving process demonstrates a thorough understanding of the relationships between all of the important elements of the problem; accurately determines the area of the figure and divides by 9 to determine the amount of paint required.