# El estudiante experto en matemáticas...

1

Comprende los problemas y persevera en resolverlos.

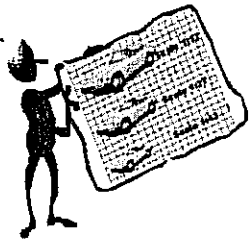
2

Razona de forma abstracta y cuantitativa.

3

Construye argumentos válidos y critica el razonamiento de otros.

4



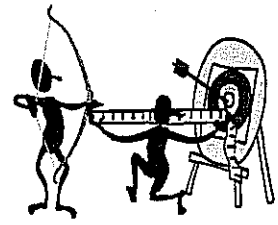
Usa las matemáticas para representar ideas y soluciones.

5

Usa estratégicamente, las herramientas apropiadas

6

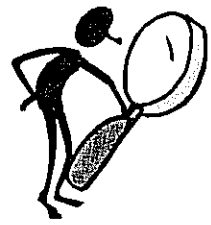
Intenta lograr precisión.



7

Busca y usa estructuras.

8



Busca y expresa regularidad en razonamiento repetitivo.

## Ejemplo de Ejercicio para un Aprendiz
## Caminata patrocinada por el 3er Grado

Los estudiantes de la Escuela Primaria de Mountain View participan en una caminata patrocinada por la escuela.

1.Jack está aportando $6 por cada vuelta que camina. Bill aporta $4 por cada vuelta que camina. Jack y Bill caminan 5 vueltas cada uno. ¿Cuánto dinero recaudan Jack y Bill en total? $_____

Explique cómo llegó a su respuesta.

2. María dio 6 vueltas. Ella recaudó $30. ¿Cuánto recibió de apoyo por cada vuelta? $_____

Explique cómo llegó a su respuesta.

3.Sara quiere recaudar por lo menos $20. Ella ha recaudado $3 por cada vuelta. ¿Cuál es el mínimo número de vueltas que tiene que dar? $_____

Explique cómo llegó a su respuesta.

| **Caminata Patrocinada** **3er Grado** | | **Evaluación** |
|---|---|---|
| Los elementos principales de rendimiento requeridos para este ejercicio son:<br>• Elegir y utilizar operaciones numéricas en un contexto real.<br><br>Basado en esto, se deben otorgar créditos por aspectos específicos de rendimiento de la siguiente manera | Puntos | Puntos en la sección |
| 1. Presenta la respuesta correcta: $50<br><br>Muestra el trabajo realizado así:<br>6 + 4 = 10 ó 5 x 6 = 30<br>10 x 5 =50 5 x 4 = 20<br>30 + 20 =<br><br>Aceptar la adición repetida. | 1<br><br><br>1<br>1<br>1 ft | 4 |
| 2. Presenta la respuesta correcta: $5<br>Muestra el trabajo así:<br>$30 + 6 =<br><br>Aceptar la adición/sustracción repetida | 1<br><br>1 | 2 |
| 3. Presenta la respuesta correcta: 7<br><br>Ofrece una explicación correcta tal como:<br>Si ella da 6 vueltas, recaudará 6 x $3 = 18, por lo tanto ella tendrá que dar otra vuelta para recaudar por lo menos $20.<br><br>Crédito parcial<br>Ver el trabajo así: 20 + 3 =6<br>ó 6 x 3 = 18 | 1<br><br><br><br>2<br><br>(1) | 3 |
| **Total de Puntos** | | **9** |

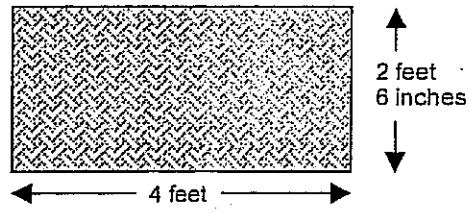
# Rugs

This problem gives you the chance to:
- find perimeters of shapes
- use Pythagoras' Rule

Hank works at a factory that makes rugs.

The edge of each rug is bound with braid. Hank's job is to cut the correct length of braid for each rug.

1. The factory makes a rectangular rug that is 4 feet long and 2 feet 6 inches wide.

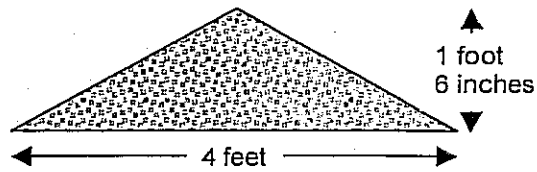



How much braid will Hank need to cut to go all the way around this rug?

_____ feet

Show your work.

2. The factory makes a triangular rug. It is an isosceles triangle 4 feet wide with a perpendicular height of 1 foot 6 inches.

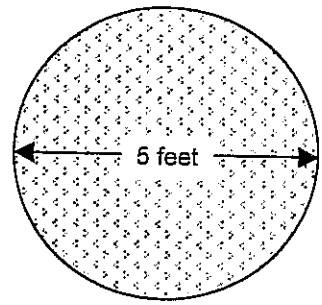



How much braid will Hank need to cut to go all the way around this rug?

_____ feet

Show your work.

3. The factory also makes a circular rug that has a diameter of 5 feet.




How much braid will Hank need to go all the way around this circular rug? Give your answer in whole feet.

*The circumference of a circle = $2\pi r$*
*The area of a circle = $\pi r^2$*

_____ feet

Show your work.

4. There are plans to make a semi-circular rug which also has a diameter of 5 feet. Hank thinks that this rug will need half as much braid as the circular rug.

Explain why Hank is not correct.

_____

_____

_____

_____

How much braid will this rug need? _____ feet

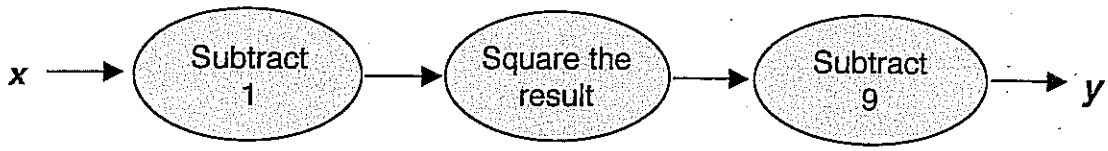
8

| Task 2: Rugs | Rubric | |
|---|---|---|
| The core elements of performance required by this task are:<br>• find perimeters of shapes<br>• use Pythagoras' Rule<br>Based on these, credit for specific aspects of performance should be assigned as follows | points | section points |
| 1. Gives a correct answer: **13** feet<br><br>**and** shows correct work such as:<br>2 x (4 + 2.5) | 1 | 1 |
| 2. Gives a correct answer: **9** feet<br><br>Shows correct work such as:<br>Attempts to use the Pythagorean Rule.<br>$x^2 = 2^2 + 1.5^2 = 6.25$<br>$x = 2.5$<br>2.5 + 2.5 + 4 Addition of sides. | 1<br><br>1<br><br>1ft | 3 |
| 3. Gives a correct answer: **16** feet or $5\pi$ feet<br><br>Shows correct work such as:<br>5 x | 1<br><br>1 | 2 |
| 4. Gives a correct explanation such as:<br><br>The curved part would be half the length of the circumference of the circle but you would need to add on 5 feet for the straight edge.<br><br>Gives correct answer: 13 feet | 1<br><br>1 | 2 |
| **Total Points** | | **8** |

# Quadratic

This problem gives you the chance to:
- work with a quadratic function in various forms

This is a quadratic number machine.




1. a. Show that, if $x$ is 5, $y$ is 7.

b. What is $y$ if $x$ is 0?

c. Use algebra to show that, for this machine, $y = x^2 - 2x - 8$.

The diagram on the next page shows the graph of the machine's quadratic function $y = x^2 - 2x - 8$ and the graphs of $y = 3$ and $y = x$.

2. a. Which point on the diagram shows the minimum value of $y$?

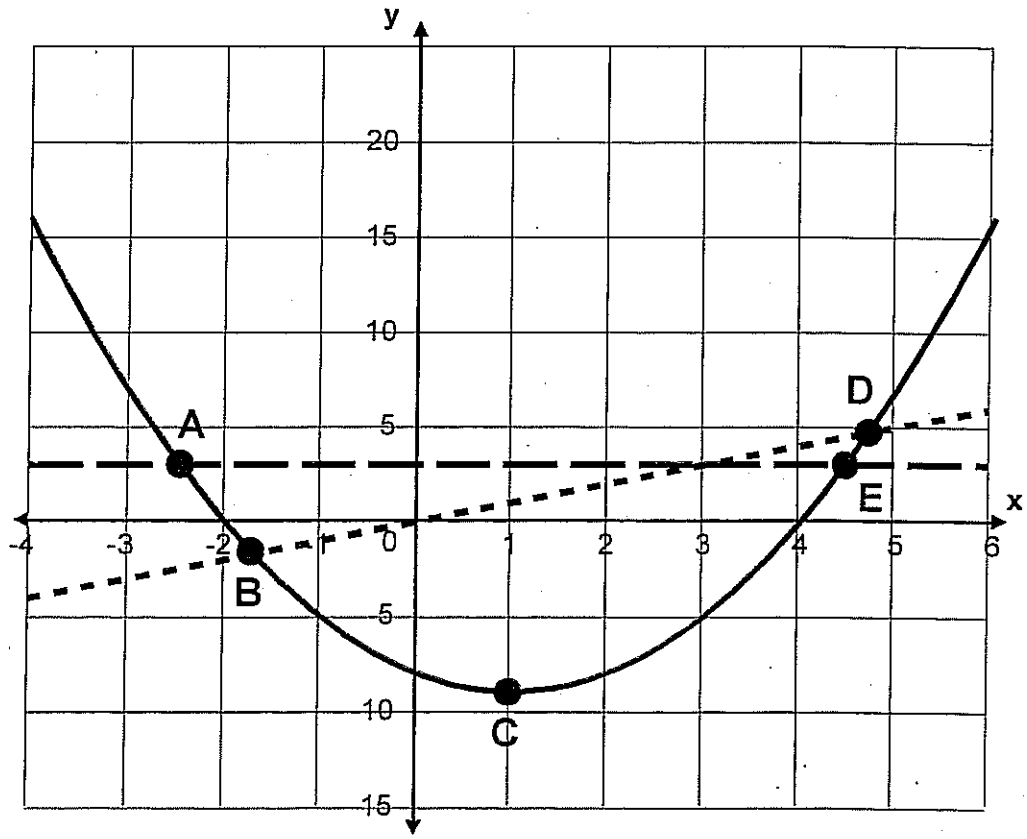
b. Which point(s) on the diagram show(s) the solution(s) to the equation $3 = x^2 - 2x - 8$?

c. Which point(s) on the diagram show(s) the solution(s) to the equation $x = x^2 - 2x - 8$?

3. a. Use the graph to solve the equation $x^2 - 2x - 8 = 0$. Mark the solutions on the graph.

x = _____ or x = _____

b. Use algebra to solve the same equation.



| **Quadratic** | Rubric | |
|---|---|---|
| The core elements of performance required by this task are:<br>• work with a quadratic function in various forms<br><br>Based on these, credit for specific aspects of performance should be assigned as follows | points | section points |
| 1. a. Gives a correct answer: $5 \rightarrow 4 \rightarrow 16 \rightarrow 7$<br>b. Gives a correct answer: **- 8**<br>c. Gives a correct answer:<br>$y = (x-1)^2 - 9$<br>$= x^2 - 2x + 1 - 9$<br>$= x^2 - 2x - 8$ | 1<br>1<br><br><br><br>2 | 4 |
| 2. a. Gives a correct answer: **C**<br>b. Gives a correct answer: **A and E**<br>c. Gives a correct answer: **B and D** | 1<br>1<br>1 | 3 |
| 3. a. Gives a correct answer: **-2, 4**<br>b. Gives a correct answer such as: (x+2)(x-4) = 0, so x = -2 or 4 or uses completing the square to find 1 or 2 correct answers or uses quadratic formula. | 1<br><br>1 | 2 |
| **Total Points** | | **9** |