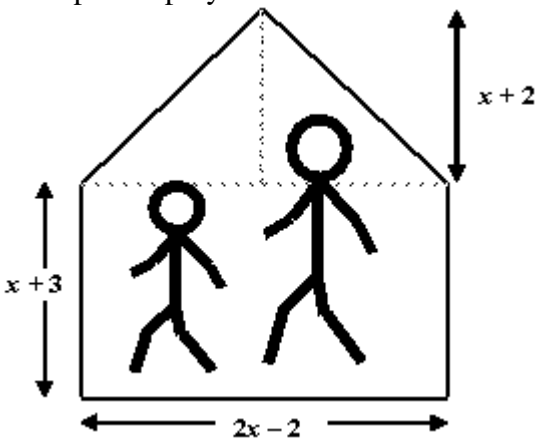
**MCF 3M1**

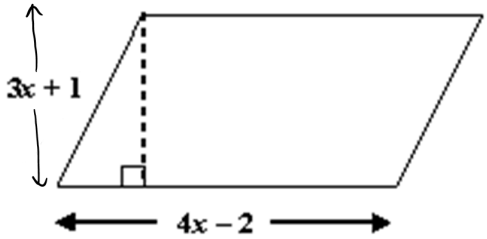
# The Algebra of Quadratic Expressions Review: Application & Thinking Inquiry Questions

1. Write the area of the sign as a simplified polynomial.



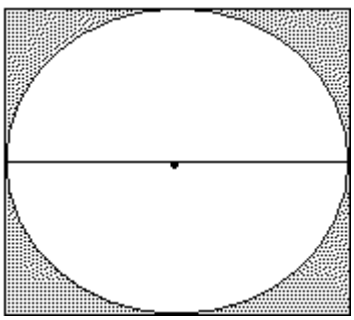

2. Can the expression $(x^2 + 4)(x^2 - 4)$ be factored further? Explain.

3. A wooden panel is a parallelogram with a height that measures $3x + 1$ *cm* and a base that measures $4x - 2$ *cm*.




   a. How much paint will you need to paint both sides of the panel? Write your answer as a simplified polynomial.
   b. If $x = 7$ *cm*, how many $cm^2$ of paint will you use?

4. Regan cut this circle from a square piece of fabric and threw the rest away.
   a. If the area of the square is $4x^2 + 24x + 36$ square units, what is the area of the circular fabric? Explain.
   b. Then write an expression for the amount of fabric Regan threw away.



**MCF 3M1**

# The Algebra of Quadratic Expressions Review: APP & TIPS Questions
# SOLUTIONS

1. ANS:
   $3x^2 + 5x - 8$

2. ANS:
   Yes. $(x^2 + 4)$ cannot be factored any more, but $(x^2 - 4)$ is a difference of squares and can be factored to $(x + 1)(x - 1)$; so $(x^2 + 4)(x^2 - 4) = (x^2 + 4)(x + 1)(x - 1)$.

3. ANS:
   a) $2[(3x + 1)(4x - 2)]$

   $2(12^2 + 4x - 6x - 2)$

   $2(12x^2 - 2x - 2)$

   $24x^2 - 4x - 4$

   b) $24(7)^2 - 4(7) - 4$

   $24(49) - 28 - 4$

   $1176 - 32 = 1144\,cm^2$

4. ANS:
   a) Factor the area of the square to find the dimensions of the square.
   $A = 4x^2 + 24x + 36$

   $A = 4x^2 + 12x + 12x + 36$

   $A = (2x + 6)(2x + 6)$

   So, each side of the square is $2x + 6$.
   Since the diameter of the circle is the same as the length of each side of the square, the diameter is $2x + 6$.
   The radius is $\frac{2(x + 3)}{2} = x + 3$
   The formula for the area of a circle is $\pi r^2$.
   Substitute $(x + 3)$ for $r$ and expand.
   $\pi(x + 3)(x + 3)$

   $\pi(x^2 + 6x + 6x + 9)$

   $\pi(x^2 + 12x + 9)$

   $\pi x^2 + 12\pi x + 9\pi$

   b) Subtract the area of the circle from the area of the square to find the area of the fabric that was thrown away.
   $(4x^2 + 24x + 36) - (\pi x^2 + 6\pi x + 9\pi)$

   $4x^2 + 24x + 36 - \pi x^2 - 6\pi x - 9\pi)$
   The terms cannot be combined any further.