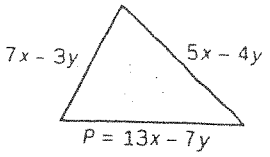
MPM3D Application - Polynomials & Factoring

16. Measurement Given the perimeter, P, and the lengths of two sides of the triangle, find the length of the third side. (x)



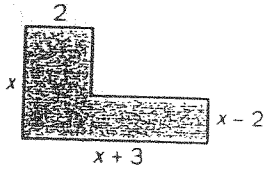
17. Ancient pyramid The Pyramid of the Moon at Teotihuacán in Mexico has a rectangular base. The length is 10 m more than the width. Therefore, if the width is represented by x, the length is $x + 10$.

a) Write and expand an expression that represents the area of the base. ⓐ [$x(x+10) = x^2 + 10x$]

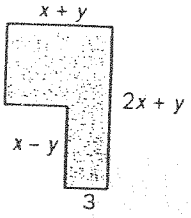
b) If x represents 140 m, what is the area of the base, in square metres? ⓑ 21000 m^2

11. Measurement Write and simplify an expression to represent the area of each figure.

a)



b)

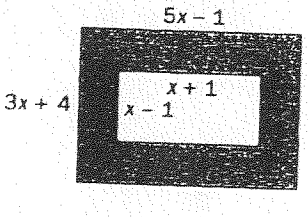


ⓐ $x^2 + x - 2$

ⓑ $x^2 + 3xy + 2y^2 + 3x - 3y$

12. Measurement Write and simplify an expression to represent the area of the shaded region.

[$14x^2 + 17x - 3$]



5. Vertical motion If an object is thrown vertically upward at a speed of v metres per second, the approximate height of the object, in metres, after t seconds is given by the expression $vt - 5t^2$.

a) A ball is thrown vertically upward at a speed of 20 m/s. Write the expression that gives the height of the ball, in metres, after t seconds.

b) Make a table to find the height of the ball after 0 s, 1 s, 2 s, 3 s, 4 s, and 5 s.

c) What is the maximum height of the ball?

d) **Communication** Why does the height of the ball after 5 s have no meaning?

e) At what times is the height 0 m?

f) Factor the expression you wrote in part a).

g) **Communication** How does the factored expression let you determine the times when the height of the ball is 0 m?

ⓐ $20t - 5t^2$

ⓑ 0, 15, 20, 15, 0, -25

ⓒ 20 m

ⓓ distance can't be neg

ⓔ 0s, 4s

ⓕ $5t(4 - t)$

ⓖ height is 0, when $5t = 0$ and $4 - t = 0$

6. Transportation Sydney Harbour Bridge in Australia is unusually wide for a long-span bridge. It carries two rail lines, eight road lanes, a cycle lane, and a walkway.

a) Factor the expression $10x^2 - 7x - 3$ to find binomials that represent the length and the width of the bridge.

b) If x represents 50 m, what are the length and the width of the bridge, in metres?

ⓐ $(10x + 3)(x - 1)$

ⓑ 503 m x 59 m