Activity 1.3.3: Solving Problems Involving Factors of Polynomials

Total points = 63

Answers

1. Let x = the number ✓
   $6x^2 = 18x$ ✓
   $6x^2 - 18x = 0$ ✓
   $6x(x-3) = 0$ ✓
   $\dfrac{6x}{6} = \dfrac{0}{6}$ ✓
   $x = 0$ ✓
   $x - 3 = 0$ ✓
   $x - 3 + 3 = 0 + 3$ ✓
   $x = 3$ ✓
   ∴ the number is 3. ✓

2. Let x = the first integer ✓, $x + 1$ = the second integer ✓
   $x(x+1) = 306$ ✓
   $x^2 + x = 306$ ✓
   $x^2 + x - 306 = 0$ ✓
   $(x-17)(x+18) = 0$ ✓
   $x - 17 = 0$ ✓
   $x - 17 + 17 = 0 + 17$ ✓
   $x = 17$ ✓
   $x + 18 = 0$ ✓
   $x + 18 - 18 = 0 - 18$ ✓
   $x = -18$ ✓
   ∴ the first number is 17 ✓, the second number is 18 ✓.

3. Let x = the width of the rug ✓, $2x - 6$ = the length of the rug ✓
   $x(2x-6) = 108$ ✓
   $2x^2 - 6x = 108$ ✓
   $2x^2 - 6x - 108 = 0$ ✓
   $2(x-9)(x+6) = 0$ ✓
   $x - 9 = 0$ ✓
   $x - 9 + 9 = 0 + 9$ ✓
   $x = 9$ ✓
   $x + 6 = 0$ ✓
   $x + 6 - 6 = 0 - 6$ ✓
   $x = -6$ ✓
   ∴ the width of the rug is 9cm ✓

4. Let x = the width of the room ✓, $x + 5$ = the length of the room ✓
   $x(x+5) = 84$ ✓
   $x^2 + 5x = 84$ ✓
   $x^2 + 5x - 84 = 0$ ✓
   $(x-7)(x+12) = 0$ ✓
   $x - 7 = 0$ ✓
   $x - 7 + 7 = 0 + 7$ ✓
   $x = 7$ ✓
   $x + 12 = 0$ ✓
   $x + 12 - 12 = 0 - 12$ ✓
   $x = -12$ ✓
   ∴ the width of the room is 7 feet ✓ and the width of the room is 12 feet ✓

5. Let x = the number ✓
   $4x^2 = 8x + 45$ ✓
   $4x^2 - 8x - 45 = 0$ ✓
   $(2x-9)(2x+5) = 0$ ✓
   $2x - 9 = 0$ ✓
   $\dfrac{2x}{2} = \dfrac{9}{2}$ ✓
   $x = \dfrac{9}{2}$ ✓
   $2x + 5 = 0$ ✓
   $\dfrac{2x}{2} = \dfrac{-5}{2}$ ✓
   $x = \dfrac{-5}{2}$ ✓
   ∴ the number is $\dfrac{9}{2}$ ✓ or $\dfrac{-5}{2}$ ✓