Math 10

Lesson 2–4 Answers

**Lesson Questions**

**Question 1**

If possible, factor each trinomial.

a) x2 + 2x – 8 b) a2 + 7a – 18 c) –30 + 7m + m2

2 factors of –30 that add up to 7

–3(10) = –30

–3 + 10 = 7

–30 + 7m + m2

= (–3 + m) (10 + m)

= (m – 3) (m + 10)

2 factors of –18 that add up to 7

–2(9) = –18

–2 + 9 = 7

a2 + 7a – 18

= (a + 9)(a – 2)

2 factors of –8 that add up to 2

4 – 2 = –8

4 – 2 = 2

x2 + 2x – 8

= (x + 4)(x – 2)

**Question 2**

If possible, factor each binomial.

a) x2 – 9 b) 16a2 – 25c2 c) 7g3h2 – 28g5

x2 – 9

= x2 – (3)2

= (x + 3)(x – 3)

first factor out GCF

7g3h2 – 28g5

= 7g3 (h2 – 4g2)

= 7g3 (h2 – (2g)2)

= 7g3 (h + 2g)(h – 2g)

16a2 – 25c2

= (4a)2 – (5c)2

= (4a + 5c)(4a – 5c)

**Question 3**

Show why it is not possible to factor m2 + 16.

If it were possible, the only possible factors would be 4 and 4 or 4 and –4 or –4 and –4

When we multiply the possible factors we get different results:

(x + 4)(x – 4)

= x2 – 16

(x + 4)(x + 4)

= x2 + 4x + 4x + 16

= x2 + 8x + 16

(x – 4)(x – 4)

= x2 – 4x – 4x + 16

= x2 – 8x + 16

**Question 4**

If possible, factor each trinomial.

a) x2 + 6x + 9 b) 2a2 – 44a + 242 c) h2 – 12h – 36

first, factor out GCF

2(a2 – 22a + 121)

121 is a perfect square

(–11)2 = 121 and –11 + –11 = –22

∴ 2(a2 – 22a + 121)

= 2(a – 11)(a – 11)

= 2(a – 11)2

9 is a perfect square 32 = 9 and 3 + 3 = 6

∴ x2 + 6x + 9

= (x + 3)(x + 3)

= (x + 3)2

=

This trinomial is not factorable for integers. There are no factors of a –36 that add up to –12.

**Assignment**

1. a) (x + 2)(x – 2) b) (2x + 3)(2x – 3)
c) (x + 4)(x + 4) d) (x – 3)(x – 3)

2. a) x2 – 64 b) 4x2 – 25

c) 9a2 – 4b2 d) 3t2 – 75

3. a) x2 + 6x + 9 b) 25a2 – 30ab + 9b2

c) 4h2 + 12h + 9 d) 5x2 – 20xy + 20y2

4. a) (x + 4)(x – 4) b) (b + 11)(b – 11)

c) not factorable d) (3a + 4b)(3a – 4b)

e) (6c + 7d)(6c – 7d) f) not factorable

g) not factorable h) (10 + 3t)(10 – 3t)

5. a) (x + 6)(x + 6) b) (x + 5)(x + 5)

c) not factorable d) (m – 13)(m – 13)

e) (4k – 1)(4k – 1) f) (7 – m)(7 – m)

g) not factorable h) (6a + 7)(6a + 7)

6. a) 5(t2 – 20) b) 10xy(x + 3)(x – 3)

c) 4(x2 – 12x + 9) d) 2x(3x + 2)(3x + 2)

e) (x2 + 4) (x + 2) (x – 2) f) (x + 3)2 (x – 3)2

7. a) –16b is not a perfect square term.

b) There are no pairs of integers that have a product of –12 and a sum of –7.

c) The trinomial is not of the form (*a*x)2 – *2ab*x + *b*2.

d) 49t2 + 100 is not a difference of squares.

8. a) 280 b) 460 c) 600 d) –600

9. a) π(r + 4)2 – πr2

b) 8π(r + 2)

c) 201.1 cm2

10. a) Never true. (–b) 2 ≠ –b2

b) Sometimes true. It is true if a = 0 or b = 0.

c) Sometimes true. When b = 0,

a2 – 02 = a2 – 2a(0) + 02

a2 = a2

d) Always true. (a + b) 2 = a2 + 2ab + b2.

11. Rahim is correct; 4(4x2 + y2) cannot be factored further.