**Lesson 4: Subtracting Polynomials**

**1.** Use algebra tiles. Sketch your tile model. Record your answer symbolically.

**a)** (4*x* + 2) – (2*x* + 1) **b)** (4*x* + 2) – (–2*x* +1)

**c)** (4*x* + 2) – (2*x* – 1) **d)** (4*x* + 2) – (–2*x* – 1)

**2.** Use algebra tiles to model find each difference. Sketch your tile model. Record your answer symbolically.

**a)** (2*s*2 + 3*s* + 6) – (*s*2 + *s* + 2) **b)** (2*s*2 + 3*s* – 6) – (*s*2 + *s* – 2)

**c)** (–2*s*2 + 3*s* + 6) – (–*s*2 + *s* + 2) **d)** (2*s*2 – 3*s* + 6) – (*s*2 – *s* + 2)

**3.** Use a personal strategy to subtract. Check your answers by adding.

**a)** (2*x* + 3) – (5*x* + 4) **b)** (4 – 8*w*) – (7*w* + 1)

**c)** (*x*2 + 2*x* – 4) – (4*x*2 + 2*x* – 2) **d)** (–9*z*2 – *z* – 2) – (3*z*2 – *z* – 3)

**4.** A student subtracted   
(3*y*2 + 5*y* + 2) – (4*y*2 + 3*y* + 2) like this:  
= 3*y*2 – 5*y* – 2 – 4*y*2 – 3*y* – 2  
= 3*y*2 – 4*y*2 – 5*y* – 3*y* – 2 – 2  
= –*y*2 – 8*y* – 4

**a)** Explain why the student’s solution is incorrect.

**b)** What is the correct answer? Show your work.

**5.** The difference between two polynomials is (5*x* + 3). One of the two polynomials is   
(4*x* + 1 – 3*x*2). What is the other polynomial? Explain how you found your answer.

**6.** Subtract.

**a)**  (*mn* – 5*m* – 7) – (–6*n* + 2*m* + 1)

**b)** (2*a* + 3*b* – 3*a*2 + *b*2) – (–*a*2 + 8*b*2 + 3*a* – *b*)

**c)** (*xy* – *x* – 5*y* + 4*y*2) – (6*y*2 + 9*y* – *xy*)

**Lesson 5: Multiplying and Dividing a Polynomial by a Constant**

**1.** Multiply. Sketch the tiles for one product.

**a)** 2(3*b*) **b)** –2(6*h*) **c)** 4(2*b*2)

**d)** –2(2*x*2*)* **e)**–2(–*y*2)**f)**–3(–2*f*)

**2.** Divide. Sketch the tiles for one division statement.

**a)** 12*d* ÷ 4 **b)** –20*d* ÷ 5 **c)** 8*d* ÷ –4

**d)** 12*y*2 ÷ 4 **e)** –14*x*2 ÷ 2 **f)** –10*q* ÷ –5

**3.** Determine each product.

**a)** 4(3*a* + 2) **b)** (*d*2 + 2*d*)(–3)

**c)** 2(4*c*2 – 2*c* + 3) **d)** (–2*n*2 + *n* – 1)(6)

**e)** –3(–5*m*2 + 6*m* + 7)

**4.** Here is a student’s solution for a multiplication question.  
(–5*k*2 – *k* – 3)(–2)  
= –2(5*k*2) – 2(*k*) –2(3)  
= –10*k*2 – 2*k* – 6

**a)** Explain why the student’s solution is incorrect.

**b)** What is the correct answer? Show your work.

**5.** Determine each quotient.

**a)** (16*v* + 16) ÷ (8) **b)** (25*k*2 – 15*k*) ÷ (5)

**c)** (20 – 8*n*) ÷ (–4) **d)** (18*x*2 – 6*x* + 6) ÷ (6)

**e)** (7 – 7*y* + 14*y*2) ÷ (–7)

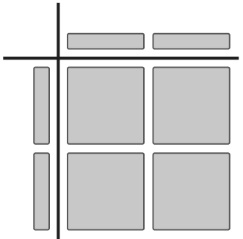
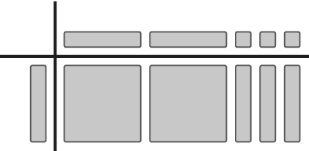
**6.** Here is a student’s solution for a division question.  
(–12*r*2 – 8*r* – 16) ÷ (–4)  
=   
= –3*r*2 – 2*r* + 4

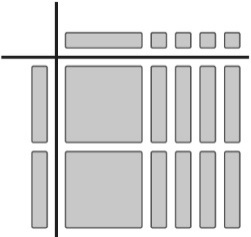
**a)** Explain why the student’s solution is incorrect.

**b)** What is the correct answer? Show your work.

**Lesson 5.6 Multiplying and Dividing a Polynomial by a Monomial**

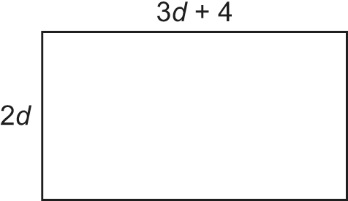
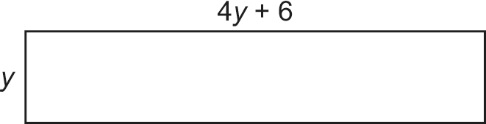
**1.** Write the multiplication sentence modelled by each set of algebra tiles.

**a)** **b)**

**c)**

**2.** For each set of algebra tiles in question 1, write a division sentence.

**3.** Write the multiplication sentence modelled by each rectangle.

**a)** **b)**

**4.** For each rectangle in question 3, write a division sentence.

**5.** Multiply.

**a)** *v*(3*v* + 1) **b)** 3*c*(5*c* + 2) **c)** (8 + 4*y*)(6*y*)

**d)** 5*p*(–5 – 2*p*) **e)** (7*k* – 3)(–*m*) **f)** (–1 – 10*r*)( –*r*)

**6.** Divide.

**a)** (6*x* + 3) ÷ 3 **b)** (14*w* – 7) ÷ –7 **c)** (–15 – 10*q*) ÷ 5

**d)** (8*z*2 + 4*z*) ÷ 2*z* **e)** (12*c*2 – 6*c*) ÷ 3*c* **f)** (9*xy* – 6*x*) ÷ –3*x*

**7.** Here is a student’s solution for a division question.  
(–12*x*2 – 9*x* – 12*xy*) ÷ (–3*x*)  
=   
= 4*x*2 – 3 + 4*xy*

**a)** Explain why the student’s solution is incorrect.

**b)** What is the correct answer?