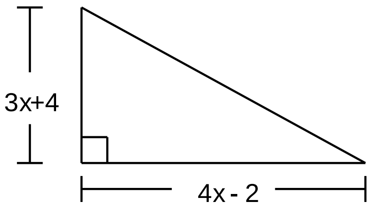
# Solutions 2

*CHAPTER 2: The Algebra of Quadratic Expressions*

1. Write a simplified expression to represent the area of the triangle.




$$A=\frac{b\times h}{2}$$
$$=\frac{(4x-2)(3x+4)}{2}$$
$$=\frac{12x^2+16x-6x-8}{2}$$
$$=\frac{12x^2+10x-8}{2}$$
$$=\frac{2(6x^2+5x-4)}{2}$$
$$=6x^2+5x-4$$

2. Factor fully.

(a) $-2x^2+8x-10$
$=-2(x^2-4x+5)$
$=-2(x-1)(x-4)$

(b) $x^2-4x-32$
$=(x-8)(x+4)$

(c) $63m^2-7n^2$
$=7(9m^2-n^2)$
$=7(3m-n)(3m+n)$

(d) $16a^2-24ab+9b^2$
$=(4a-3b)^2$
*NOTE : This is a trinomial square!*

(e) $21x^2-13xy+2y^2$
$=\frac{(21x-7y)(21x-6y)}{21}$
$=\frac{7(3x-y)3(7x-2y)}{21}$
$=(3x-y)(7x-2y)$

(f) $-2x^2+7x+15$
$=-(2x^2-7x-15)$
$=-\frac{(2x-10)(2x+3)}{2}$
$=-\frac{2(x-5)(2x+3)}{2}$
$=-(x-5)(2x+3)$

3. Identify the following as a monomial, binomial, or trinomial.

(a) $x^2-2x$
binomial

(b) $(x-2)(x+1)$
monomial
*(in this form)*

(c) $3x^2-x-2$
trinomial

(d) $x^2(x+1)-2x(x+1)+7$
trinomial

4. Factor each using the product of prime numbers.

(a) 304
$=2\times152$
$=2\times2\times76$
$=2\times2\times2\times38$
$=2\times2\times2\times2\times19$
$=2^4\times19$

(b) 9200
$=100\times92$
$=2\times5\times46\times2$
$=2\times5\times2\times23\times2$
$=2^3\times5\times23$

5. What are ALL possible integer values, $k$, such that $x^2+kx-32$ can be factored?

$-32=1\times(-32)\Rightarrow k=-31$

$-32=-1\times 32 \quad \Rightarrow k=31$

$-32=4\times(-8)\Rightarrow k=-4$

$-32=-4\times 8\Rightarrow k=4$

$-32=2\times(-16)\Rightarrow k=-14$

$-32=-2\times 16\Rightarrow k=14$

$\therefore$ *all possible values for* $k$ *are*

$\pm 4,\ \pm 14,\ \pm 31$

6. Factor fully.

(a) $3(b^2-4)+a^2(b^2-4)$

$=(b^2-4)(3+a^2)$ *factor out the common bracket*

$=(b-2)(b+2)(3+a^2)$

(b) $18(2-x)+x^2(x-2)+3x(x-2)$

$=-18(x-2)+x^2(x-2)+3x(x-2)$

$=(x-2)(-18+x^2+3x)$

$=(x-2)(x^2+3x-18)$

$=(x-2)(x+6)(x-3)$

7. Expand and simplify.

(a) $3(x^2-2)-4x(3x-7)$

$=3x^2-6-12x^2+28x$

$=-9x^2+28x-6$

(b) $-(a-3)^2+3(5a+2)^2$

$=-(a^2-3a-3a+9)+3(25a^2+10a+10a+4)$

$=-(a^2-6a+9)+3(25a^2+20a+4)$

$=-a^2+6a-9+75a^2+60a+12$

$=74a^2+66a+3$

8. Name an integer, $k$, such that the quadratic $6x^2-22x+k$ can be factored.

*NOTE*: $6\times k$ *must result in a number such that two factors of this number add up to be* $-22$.

*Have the instructor check your answer.*

9. Find the GCF for each of the following polynomials.

(a) $12a^3b^3-6a^4b^2+9a^5b^4$

$GCF=3a^3b^2$

(b) $5x^2(x+y)-20y^2(-x-y)$

$=5x^2(x+y)+20y^2(x+y)$

$\therefore\ GCF=5(x+y)$

***EXTRA QUESTIONS – Chapter 2 p. 122 # 1b, 5, 6, 8, 9***
***p. 186 # 9 – 11***