6.1-6.4 In-class Practice Math 085

1. Factor out the greatest common factor. Simplify the remaining factor, if possible.

a) $6k^3 - 36k^4 - 48k^5$
b) $15y^3z^3 - 27y^2z^4 + 3yz^3$
c) $(3x+2)(x-4) - (3x+2)(x+8)$
d) $2(5-x)^3 - 3(5-x)^2$
e) $x^{\frac{1}{3}} - 7x^{\frac{4}{3}}$
f) $2x^{-\frac{1}{2}} - 5x^{-\frac{3}{2}}$
g) $0.18x + 0.6x^2$
h) $3a^{n+1} + 6a^n - 15a^{n+2}$

2. Factor by grouping.

a) $b^3 - b^2 + 2b - 2$
b) $y^3 + 8y^2 - 5y - 40$
c) $2xy + x^2y - 6 - 3x$
d) $x^3y^2 - 3 - 3y^2 + x^3$

3. Factor trinomial. Remember to factor out the GCF first, if possible.

a) $p^2 - 12p + 27$
b) $x^2y^2 + 11xy + 18$
c) $m^4 + 12m^2 - 45$
d) $a^2 - 7ab + 12b^2$
e) $8x^2 - 6x - 9$
f) $8x + 30x^2 - 6$
g) $14x^4 - 19x^3 - 3x^2$
h) $-15a^2 - 70a + 120$
i) $3x^6 + 4x^3 - 4$
j) $4x^{2a} - 4x^a - 3$
k) $4(x-y)^2 - 23(x-y) - 6$
l) $2k^2(5-y) + 7k(y-5) + 5(5-y)$

4. Which of the binomials are differences of squares?
a) $64 - a^2$
b) $2x^2 - 25$
c) $k^2 + 9$
d) $4z^2 - 49$

5. Which of the binomials are sums or differences of cubes?
a) $64 + r^3$
b) $125 - p^6$
c) $9x^3 + 125$
d) $(x+y)^3 - 1$

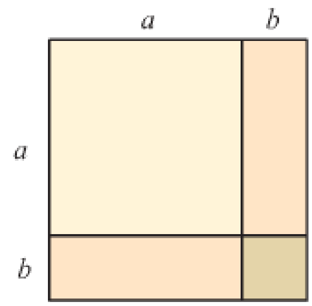
6. Which of the trinomials are perfect squares?
a) $x^2 - 8x - 16$
b) $4m^2 - 20m + 25$
c) $9z^4 + 30z^2 + 25$
d) $25a^2 - 45a + 81$

7. Use special factoring formulas to factor completely the given polynomials.

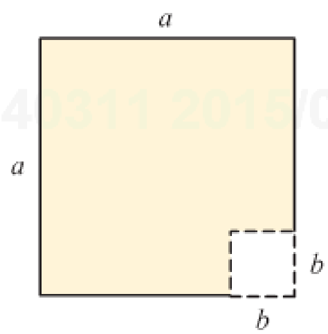
a) $36p^2 - 25$
b) $64 - (x+2y)^2$
c) $18x^3 - 50x$
d) $0.04x^2 - 0.09y^2$
e) $9x^2 + 12x + 4$
f) $5c^3 + 20c^2 + 20c$
g) $49p^4 - 84p^2q + 36q^2$
h) $x^2y - 25y + 3x^2 - 75$
i) $x^2 - 2xy + y^2 - 25$
j) $9x^{2n} - 6x^n + 1$
k) $n^4 - 625$
l) $(2x-1)^2 + 8(2x-1) + 16$
m) $64a^3 - 27b^3$
n) $250x^3 + 54y^3$
o) $(a+1)^3 - b^6$
p) $-x^2 - y^2 + 2xy + 9$
q) $y^4 + y^3 + y + 1$
r) $x^2 + 6x - y^2 + 9$
s) $24x^{2a} - 6$
t) $a^{2n+1} - 2a^{n+1} - 15a$

8. Show how the geometric model can be used to verify the special factoring formula.

a. $a^2 + 2ab + b^2 = (a + b)^2$



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



FOR INDIVIDUAL OR GROUP WORK

The binomial $x^6 - y^6$ may be considered either as a difference of squares or a difference of cubes. ***Work Exercises 65–70 in order.***

65. Factor $x^6 - y^6$ by first factoring as a difference of squares. Then factor further by considering one of the factors as a sum of cubes and the other factor as a difference of cubes.

66. Based on your answer in **Exercise 65,** fill in the blank with the correct factors so that $x^6 - y^6$ is factored completely.

$$x^6 - y^6 = (x - y)(x + y)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$$

67. Factor $x^6 - y^6$ by first factoring as a difference of cubes. Then factor further by considering one of the factors as a difference of squares.

68. Based on your answer in **Exercise 67,** fill in the blank with the correct factor so that $x^6 - y^6$ is factored.

$$x^6 - y^6 = (x - y)(x + y)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$$

69. Notice that the factor you wrote in the blank in **Exercise 68** is a fourth-degree polynomial, while the two factors you wrote in the blank in **Exercise 66** are both second-degree polynomials. What must be true about the product of the two factors you wrote in the blank in **Exercise 66?** Verify this.

70. If you have a choice of factoring as a difference of squares or a difference of cubes, how should you start to more easily obtain the completely factored form of the polynomial? Base the answer on your results in **Exercises 65–69.**