

1. Factor completely.

a. $x^2 + 6x + 8$

$$(x+4)(x+2)$$

b. $x^2 - 10x + 25$

$$(x-5)(x-5)$$
$$(x-5)^2$$

c. $x^2 + 4x - 32$

$$(x+8)(x-4)$$

d. $x^2 + 6xy + 8y^2$

$$(x+4y)(x+2y)$$

e. $13 + 14m + m^2 = m^2 + 14m + 13$

$$(m+13)(m+1)$$

f. $y^2 - 12y + 11$

$$(y-11)(y-1)$$

g. $x^2 - x - 30$

$$(x-6)(x+5)$$

h. $x^2 - 7x + 5$

prime

i. $a^4 - 2a^2 - 15$

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

j. $6q - 27 + q^2 = q^2 + 6q - 27$

$$(q+9)(q-3)$$

2. Factor completely. [Hint: check for any GCF's first.]

a. $2z^2 + 20z + 32$

$$2(z^2 + 10z + 16)$$

$$2(z+8)(z+2)$$

b. $x^2 + 15x + 36$

$$(x+9)(x+3)$$

c. $x^2 + xy - 2y^2$

$$(x+2y)(x-y)$$

d. $3x^2 - 9xy + 45y$

$$3(x^2 - 3xy + 15y)$$

g. $3x^3 - 12x^2 - 36x$

$$3x(x^2 - 4x - 12)$$

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

h. $r^2 - 16r + 48$

$$(r-8)(r-12)$$

i. $r^2 - 3r + 6$

prime

j. $2t^2 + 24t + 64$

$$2(t^2 + 12t + 32)$$

$$2(t+8)(t+4)$$

$$e. -x^2 + 12x - 11$$

$$-(x^2 - 12x + 11)$$

$$-(x-11)(x-1)$$

$$f. 7a^3b - 35a^2b^2 + 42ab^3$$

$$7ab(a^2 - 5ab + 6b^2)$$

$$7ab(a-2b)(a-3b)$$

$$k. x^3y^2 + x^2y - 20x$$

$$x(x^2y^2 + xy - 20)$$

$$x(xy+5)(xy-4)$$

$$l. y^2(x+1) - 2y(x+1) - 15(x+1)$$

$$(x+1)(y^2 - 2y - 15)$$

$$(x+1)(y-5)(y+3)$$

3. Find all positive values for b or c so that the polynomial is factorable.

a. $y^2 - 4y + c$

$$3, 4$$

d. $x^2 + 6x + c$

$$5, 8, 9$$

b. $n^2 - 16n + c$

$$15, 28, 39, 48, 54, 63, 64 \quad 8, 16$$

e. $x^2 + bx + 15$

c. $m^2 + bm - 27$

$$6, 26$$

4. An object is thrown upward from the top of a 112-foot building with an initial velocity of 96 feet per second. Neglecting air resistance, the height of the object after t seconds is given by $-16t^2 + 96t + 112$. Factor this polynomial.

$$-16(t^2 - 6t - 7)$$

$$-16(t-7)(t+1)$$