

Factor each polynomial completely.

1.  $a^3 + 3a^2 + 2a + 6$

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

2.  $10b^4 - 15b^3 + 20b^2 - 30b$

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

3.  $c^2 + 5c + 6$

$$(c+2)(c+3)$$

4.  $d^2 - 2d - 8$

$$(d-4)(d+2)$$

5.  $x^2 - 12x + 36$

$$(x-6)^2$$

6.  $f^2 + 2f + 13$

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7.  $g^2 - 16$

$$(g+4)(g-4)$$

8.  $4h^2 - 4h - 80$

$$4(h-5)(h+4)$$

9.  $x^2 + 25$

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10.  $j^2 + 12j + 35$

$$(j+7)(j+5)$$

11.  $k^2 + 3k - 108$

$$(k-9)(k+12)$$

12.  $x^3 - 8x^2 + 15x$

$$x(x-5)(x-3)$$

13.  $6m^2 + 5m + 1$

$$(2m+1)(3m+1)$$

14.  $2n^2 - 5n - 12$

$$(n-4)(2n+3)$$

15.  $3x^2 - 10x + 3$

$$(x-3)(3x-1)$$

16.  $9p^2 + 7p - 16$

$$(p-1)(9p+16)$$

17.  $q^2 + 18q + 81$

$$(q+9)^2$$

18.  $4r^2 - 20r + 25$

$$(2r-5)^2$$

19.  $64x^2 + 64x + 16$

$$16(2x+1)^2$$

20.  $-16t^2 + 32t + 48$

$$-16(t-3)(t+1)$$

21.  $u^2 - 169$

$$(u-13)(u+13)$$

22.  $v^3 + 125$

$$(v+5)(v^2-5v+25)$$

23.  $21w^2 + 58w + 21$

$$(3w+7)(7w+3)$$

24.  $x^2 + 9x + 24$

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25.  $2y^2 + 6y - 20$

$$2(y-2)(y+5)$$

26.  $z^3 - 64z$

$$z(z-8)(z+8)$$

27.  $4a^2 - 6ab + 6a - 9b$

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

28.  $(c-2)^2 + 5(c-2) + 6$

$$c(c+1)$$

29.  $x^2 - d^2 + 2x - 2d$

$$-(d-x)(d+x+2)$$

30.  $12x^2 - 14xy - 10y^2$

$$2(3x-5y)(2x+y)$$