

Quiz 5.4

- 1 (2 points) Factor out the greatest common factor.

$$-18z^3 + 14z^2 + 4z$$

2. (2 points) Factor by grouping.

$$2ax - 2ay - bx + by$$

3. (3 points) Factor.

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

5.5 Factoring Trinomials

Factor

$$x^2 + 8x + 12$$

$$(x + 6)(x + 2)$$

$$\begin{array}{r|l} 12 & \\ \hline 1 & 12 \\ 2 & 6 \\ 3 & 4 \end{array}$$

You Try

$$x^2 + 9x + 18$$

Factor

$$x^2 - 10x + 24$$

$$(x - 6)(x - 4)$$

$$\begin{array}{r|l} 24 & \\ \hline -1 & 24 \\ -2 & 12 \\ -3 & -8 \\ -4 & 6 \end{array}$$

You Try

$$x^2 - 8x + 12$$

Factor

$$x^2 - 3x - 28$$

You Try

$$w^2 - 4w - 21$$

Factor

$$y^2 + 4y + 12$$

You Try

$$t^2 - 5t + 8$$

Prime
or

Not Factorable

$$\begin{array}{r|l} 8 & \\ \hline 1 & 8 \\ 2 & 4 \\ -1 & -8 \\ -2 & -4 \end{array}$$

Factor

$$3u^3 - 9u^2 - 120u$$

$$3u(u^2 - 3u - 40)$$

$$3u(u-8)(u+5)$$

You Try

$$-3z^2 - 21z - 30$$

Factor

$$p^2 + 6pq - 16q^2$$

$$(p + 8q)(p - 2q)$$

$$\begin{array}{r|l} -16 & \\ \hline 8 & -2 \\ -8 & 2 \end{array}$$

You Try

$$x^2 + 8xy + 15y^2$$

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

Factor

$$\underline{3x^2} + 14x + \underline{8}$$

$$\underline{3x^2} + \underline{2x} + \underline{12x} + \underline{8}$$

$$x(3x+2) + 4(3x+2)$$

$$(3x+2)(x+4)$$

$$3 \cdot 8 = 24$$

1	24
2	12
3	8
4	6

Factor

$$12x^2 - x - 6$$

You Try

$$6x^2 + 11x + 3$$

Factor by Trial and Error

$$10x^2 + 19x + 6$$

$$10x^2 + 15x + 4x + 6$$

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

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

60	
10	6
12	5
15	4

You Try

$$12x^2 + 32x - 35$$

Factor

$$24x^2 + 13xy - 2y^2$$

$$24x^2 + 16xy - 3xy - 2y^2$$

$$8x(3x+2y) - y(3x+2y)$$

$$(3x+2y)(8x-y)$$

-48	
6	-8
-6	8
-12	4
12	-4
-16	3
16	-3

You try

Factor using substitution $u = z^2$

$$2z^4 + z^2 - 15$$

$$2u^2 + u - 15$$

$$2u^2 + 6u - 5u - 15$$

$$2u(u+3) - 5(u+3)$$

$$(u+3)(2u-5)$$

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

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

Factor using substitution

$$3(x-3)^2 + 11(x-3) - 4$$

$$u = x-3$$

so...

$$3u^2 + 11u - 4$$

$$3u^2 + 12u - u - 4$$

$$3u(u+4) - 1(u+4)$$

$$(u+4)(3u-1)$$

$$((x-3)+4)(3(x-3)-1)$$

$$(x-3+4)(3x-9-1)$$

$$(x+1)(3x-10)$$

Yay!!!

You try

$$4(x+2)^2 + 5(x+2) - 6$$