

Review:

1. Solve the system of equations

$$\begin{cases} 3x - 6y = 6 \\ (9x - 3y = 8) \cdot (-2) \end{cases}$$

$$\begin{array}{r} 3x - 6y = 6 \\ -18x + 6y = -16 \\ \hline -15x = -10 \\ x = \frac{2}{3} \end{array}$$

$$\begin{array}{r} 3\left(\frac{2}{3}\right) - 6y = 6 \\ 2 - 6y = 6 \\ -6y = 4 \\ y = -\frac{2}{3} \end{array}$$

$$\boxed{\left(\frac{2}{3}, -\frac{2}{3}\right)}$$

2. Evaluate $f(-2)$ when $f(x) = -3x^2 - 2x + 5$

$$\begin{aligned} f(-2) &= -3(-2)^2 - 2(-2) + 5 \\ &= -3(4) + 4 + 5 \\ &= -12 + 9 = \boxed{-3} \end{aligned}$$

HW Questions?

5.4

39. $(6x - 3x^2 + x^3 - 9) \div (x + 2)$

$$\begin{array}{r} -2 \overline{) \quad 1 \quad -3 \quad 6 \quad -9} \\ \quad \quad -2 \quad 10 \quad -32 \\ \hline \quad 1 \quad -5 \quad 16 \quad -41 \end{array}$$

Q: $x^2 - 5x + 16$
R: -41

$$x^3 - 3x^2 + 6x - 9 = (x + 2)(x^2 - 5x + 16) - 41$$

$$\frac{x^3 - 3x^2 + 6x - 9}{x + 2} = x^2 - 5x + 16 - \frac{41}{x + 2}$$

$$\frac{4}{3} = 1 + \frac{1}{3}$$

5.3
 91. $(3x^n + 2)^2$
 $(3x^n + 2)(3x^n + 2)$

$\div (x - a)$
 $a \mid$
 $\div (2x + 4)$
 $\underline{-2} \mid 2(x + 2)$

5.4
 33. $(2x^2 + 24) \div (2x + 4)$
 $\underline{-2} \mid 2 \quad 0 \quad 24$
 $\quad \quad -4 \quad 8$

 $2 \quad \cancel{-4} \quad 32$

5.4
 21.

$$\begin{array}{r}
 x^2 + 1 \overline{) x^3 - 4x^2 + 2x - 1} \\
 \underline{-(x^3 + x)} \\
 -4x^2 + x - 1
 \end{array}$$

...

5.5 - factoring a polynomial

GCF - Greatest Common Factor

$$ab + ac = a(b + c)$$

$$12 = 3 \cdot 4 = 6 \cdot 2 = 12 \cdot 1 = 2 \cdot 2 \cdot 3$$

$$X^3 = X \cdot X \cdot X = X \cdot X^2 = 1 \cdot X^3$$

$$X^2 Y^3 = X^2 \cdot Y^3 = X^2 Y \cdot Y^2 = X^2 Y^2 \cdot Y = XY \cdot XY^2 = \dots$$

Factor by Grouping

$$\textcircled{2 \cdot 2 \cdot 3} 12x^3y^4 \quad \& \quad \textcircled{2 \cdot 2 \cdot 2} 8x^2y^5$$

$$\underline{\text{GCF: } 4x^2y^4}$$

1. $15x^2yz^3, 9x^3y^2z, 75x^4y^2z^2$

$$\text{GCF: } 3x^2yz$$

2. $-16x^3y^5z^6, 24x^4y^{10}z^3, 40x^2y^2z^9$

$$\text{GCF: } 8x^2y^2z^3$$

5.5

$$14. x^2y^4 - x^2y - 4x^2$$

$$x^2(y^4 - y - 4)$$

$$20. b^{n+5} - b^5$$

$$b^5(b^n - 1)$$

$$22. 14a^4b^4 - 42a^3b^3 + 28a^3b^2$$

$$14a^3b^2(ab^2 - 3b + 2)$$

$$24. 10x^2y + 20x^2y^2 + 30x^2y^3$$

$$10x^2y(1 + 2y + 3y^2)$$

Factor trinomials of the form
 $x^2 + bx + c = (x + d)(x + e)$

$$x^2 + 5x + 6 = (x + 2)(x + 3)$$

$$(-1)(6) = -6$$

$$x^2 + 5x - 6$$

$$= (x + 6)(x - 1)$$

factors of 6 (constant term)
 that sum to give you 5 (x-coeff.)

$$x^2 - 7x + 6 = (x - 6)(x - 1)$$

$$54. a^2 + a - 72 = (a + 9)(a - 8)$$

$$64. b^2 - 6b - 16 = (b - 8)(b + 2)$$

$$72. y^2 - 13y + 12$$

$$(y-12)(y-1)$$

$$74. x^2 + 7x - 18$$

$$(x+9)(x-2)$$

Factoring by Grouping

$$28. 3(x+y) + a(x+y)$$

$$(x+y)(3+a)$$

$$30. 3(a-7) - b(7-a)$$

$$= 3(a-7) - b(-1)(-7+a)$$

$$= 3(a-7) + b(a-7)$$

$$= (a-7)(3+b)$$

$$32. (x^2 - 5x) + (4x - 20)$$

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

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

$$x^2 - 5x - 4x + 20$$

$$x(x-5) - 4(x-5)$$

$$(x-5)(x-4)$$

$$34. (ab+7b) - (3a-21)$$

$$b(a+7) - 3(a+7)$$

$$(a+7)(b-3)$$

$$38. a^2b + 3a^2 + 2b + 6$$

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

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

$$48. 2y^3 - y^2 + 6y - 3$$

$$y^2(2y-1) + 3(2y-1)$$

$$(2y-1)(y^2+3)$$

5.5

#21-47

odd

Factor trinomials of the form
 $ax^2 + bx + c$

Homework