Review:

Mulply the polynomials: $(3x^2 - x^3 + 2x + 1)(4x - 5)$

$3x^2(4x) + 3x^2(-5) + (-x^3)(4x) + (-x^3)(-5) + 2x(4x) + 2x(-5) + 1(4x) + 1(-5)$

$12x^3 - 15x^2 - 4x^4 + 5x^3 + 8x^2 - 10x + 4x - 5$

$\boxed{-4x^4 + 17x^3 - 7x^2 - 6x - 5}$

Divide the polynomials: $\dfrac{x + 3x^4 - x^2 + 5x^3 - 2}{x + 2}$

$\dfrac{3x^4 + 5x^3 - x^2 + x - 2}{x + 2}$

$\begin{array}{r|rrrrr} -2 & 3 & 5 & -1 & 1 & -2 \\ & & -6 & 2 & -2 & 2 \\ \hline & 3 & -1 & 1 & -1 & \boxed{0} \end{array}$

Quotient:

$3x^3 - x^2 + x - 1$

Remainder:

0

5.7 Solving Equaons by Factoring

Zero Product Property:

If *AB=0*, then *A=0* or *B=0*

Example:

(x+2)(x-5)(3x+4)=0

Set each factor = 0 and solve for x.

$x+2=0 \quad, x-5=0 \quad, 3x+4=0$

$\boxed{x=-2 \quad, x=5}$

$3x=-4$

$\boxed{x=-\dfrac{4}{3}}$

Example of what not to do:

(x-3)(x+4)(x-2)=5

$x-3=5 \quad, x+4=5 \quad, x-2=5$

5.7

14. $x^2 + x - 6 = 0$

$(x+3)(x-2) = 0$

$x + 3 = 0 \qquad x - 2 = 0$

$x = -3 \qquad x = 2$

20. $2y^2 - 10y = 0$

$2y(y-5) = 0$

$2y = 0 \qquad y - 5 = 0$

$y = 0 \qquad y = 5$

26. $4y^2 - 19y = 5$

$4y^2 - 19y - 5 = 0$

$4(-5) = -20 = (-20)(1)$

$4y^2 - 20y + y - 5 = 0$

$4y(y-5) + 1(y-5) = 0$

$(y-5)(4y+1) = 0$

$y - 5 = 0 \qquad 4y + 1 = 0$

$\boxed{y = 5 \qquad\qquad 4y = -1}$

$\boxed{y = -\tfrac{1}{4}}$

40. $(x+2)(x-6) = 20$

$(x+2)(x-6) - 20 = 0$

$x^2 - 6x + 2x - 12 - 20 = 0$

$x^2 - 4x - 32 = 0$

$(x-8)(x+4) = 0$

$x - 8 = 0 \qquad x + 4 = 0$

$\boxed{x = 8 \qquad x = -4}$

48. $2x^3 + x^2 - 8x - 4 = 0$

$x^2(2x+1) - 4(2x+1) = 0$

$(2x+1)(x^2-4) = 0$

$(2x+1)(x+2)(x-2) = 0$

$2x+1=0 \quad , \quad x+2=0 \quad , \quad x-2=0$

$2x=-1 \qquad x=-2 \qquad x=2$

$x=-\frac{1}{2}$

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

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32. $t(t+1) = 42$

$t(t+1) - 42 = 0$

$t^2 + t = 42$

$t^2 + t - 42 = 0$

$(t+7)(t-6) = 0$

$t = -7 \quad t = 6$

42. $(a-9)(a-1) = -7$

$a^2 - a - 9a + 9 = -7$

$a^2 - 10a + 16 = 0$

$(a-8)(a-2) = 0$

$a = 8 \quad a = 2$

46. $(2-b)^2 + b^2 = 10$

$4 - 4b + b^2 + b^2 = 10$

$4 - 4b + 2b^2 - 10 = 0$

$2b^2 - 4b - 6 = 0$

$2(b^2 - 2b - 3) = 0$

$2b^2 - 6b + 2b - 6 = 0$

$2b(b-3) + 2(b-3) = 0$

$(b-3)(2b+2) = 0$

$2(b-3)(b+1) = 0$

$b-3=0 \quad 2b+2=0$

$b=3 \qquad 2b=-2$

$b=-1$

50. $12x^3 - 8x^2 - 3x + 2 = 0$

$4x^2(3x-2) - 1(3x-2) = 0$

$(3x-2)(4x^2-1) = 0$

$(3x-2)(2x-1)(2x+1) = 0$

$3x-2=0 \quad 2x-1=0 \quad 2x+1=0$

$3x=2 \quad 2x=1 \quad 2x=-1$

$x=\frac{2}{3} \quad x=\frac{1}{2} \quad x=-\frac{1}{2}$

52. $f(x) = x^2 + 4x - 2$; $f(c) = 3$

Find all values of c for which $f(c) = 3$.

$f(c) = c^2 + 4c - 2$

$c^2 + 4c - 2 = 3$

$c^2 + 4c - 5 = 0$

$(c - 1)(c + 5) = 0$

$C = 1 , c = -5$

58. $f(x) = x^3 + 3x^2 - 4x - 11$; $f(c) = 1$

$f(c) = c^3 + 3c^2 - 4c - 11$

$c^3 + 3c^2 - 4c - 11 = 1$

$c^3 + 3c^2 - 4c - 12 = 0$

$c^2(c + 3) - 4(c + 3) = 0$

$(c + 3)(c^2 - 4) = 0$

$(c + 3)(c + 2)(c - 2) = 0$

$C = -3 , C = -2 , C = 2$

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

$c^2 - 4 = c^2 - 2^2$

$= (c - 2)(c + 2)$
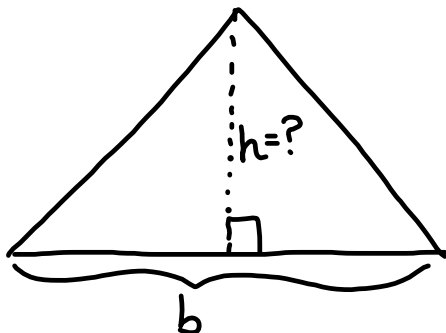
64. $x^3 + 7x = 8x^2$

$x^3 - 8x^2 + 7x = 0$

$x(x^2 - 8x + 7) = 0$

$x(x-1)(x-7) = 0$

$x=0 \qquad x-1=0 \qquad x-7=0$

$\qquad\qquad x=1 \qquad x=7$

72. height of a $\triangle$ is 4cm more than twice the length of base. Area of $\triangle$ is $35\,cm^2$. Find height.

h=?

b

$A = \frac{1}{2}bh \quad ; h = 4 + 2b$

$35 = \frac{1}{2}b(4 + 2b)$

$35 = 2b + b^2$

$0 = b^2 + 2b - 35$

$0 = (b+7)(b-5)$

$b = -7 \; ; \; b = 5$

$h = 4 + 2(5)$

$= \boxed{14\,cm}$

5.7
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#35 - 49 odd   solve

51 - 57 odd $f(c) = \sim$

61 - 75 odd   word prob's

Quiz #6 on multiplying/dividing polynomials and factoring - Fri Oct 4
Test #3 - Tues Oct 8
Test #4 - Fri Oct 18
Final Exam - Week of Oct 28!