May 4 (Monday)

Expanding/Factoring Review Practice (Optional)

1) Expand and Simplify

a. $(6x + 5)(3x + 1)$

$= 18x^2 + 6x + 15x + 5$

$= 18x^2 + 21x + 5$

b. $x(3x + 2)(2x - 5) + (2x + 4)^2$

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

$= x(6x^2 - 15x + 4x - 10) + (4x^2 + 8x + 8x + 16)$

$= x(6x^2 - 11x - 10) + (4x^2 + 16x + 16)$

$= 6x^3 - 11x^2 - 10x + 4x^2 + 16x + 16$

$= 6x^3 - 7x^2 + 6x +$

2) Factor, if possible

a. $x^2 + 12x + 27$

$ac = 27$, $b = 12$

$9 \times 3 = 27$, $9 + 3 = 12$

$(x+9)(x+3) = 0$

$x = -3, -9$

b. $4a^2 - 20a + 25$

$ac = 4 \times 25 = 100$

$b = -20$

$(-10) \times (-10) = 100$

$(-10) + (-10) = -20$

$4a^2 - 10a - 10a + 25$

$2a(2a-5) - 5(2a-5)$

$(2a-5)(2a-5) = 0$

$2a - 5 = 0$

$2a = 5 \rightarrow a = \frac{5}{2}$

c. $9x^2 + 25$

Not factorable

d. $x^2 + 2x - 3$

$ac = -3$

$b = 2$

$3 \times (-1) = -3$

$3 + (-1) = 2$

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

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

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

$x = -3, x = 1$

e. $2y^2 + 5y + 2$

$ac = 2 \times 2 = 4$

$b = 5$

$4 \times 1 = 4$

$4 + 1 = 5$

$2y^2 + 4y + y + 2 = 0$

$2y(y+2) + (y+2) = 0$

$(y+2)(2y+1) = 0$

$y + 2 = 0$ $\quad 2y + 1 = 0$

$y = -2$ $\quad 2y = -1$

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

f. $n^2 + 22n + 21$

$(x+11)(x+11) = 0$

$x = -11$

g. $x^2 - 49$

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

$x = 7, -7$

h. $9d^2 - 6d + 1$

$(3d)^2 - 2(3d)(1) + 1^2 = 0$

$(3d-1)^2 = 0$ $\quad \therefore d = \frac{1}{3}$

i. $16x^2 - 8x + 1$

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

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

$x = \frac{1}{4}$

j. $8t^2 - 18$

$a^2 - b^2$

$a = 2t$, $b = 3$

$2(4t^2 - 9) = 0$

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

$t = \frac{3}{2}, -\frac{3}{2}$

k. $2x^2 + 12x + 18$

$a^2 + 2ab + b^2$

$(a+b)^2$

$\Rightarrow 2(x^2 + 6x + 9) = 0$

$\Rightarrow 2(x+3)^2 = 0$

$a = x$, $b = 3$

$x = -3$

l. $81x^2 - 49$

$a = 9x$, $b = 7$

$(9x)^2 - (7)^2 = 0$

$(9x+7)(9x-7) = 0$

$x = \frac{7}{9}, \quad x = -\frac{7}{9}$

m. $12x^2 + 19x + 4$

$ac = 12 \times 4 = 48$

$b = 19$

$16 \times 3 = 48$

$16 + 3 = 19$

$= 12x^2 + 16x + 3x + 4$

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

$0 = (4x+1)(3x+4)$

$x = -\frac{1}{4}$

$x = -\frac{4}{3}$

n. $4x^2 - 5x + 16$

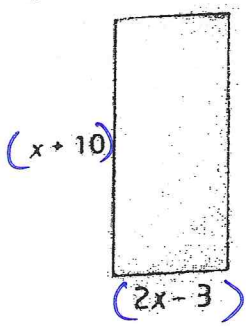
Homework: Worksheet – Solving Equations

Worksheet (pg. 279) # 8, 9, 10, 15

TIPS practice: #11

* Unit Test will be on Thursday May 7.

8. A rectangle has dimensions $x + 10$ and $2x - 3$. Determine the value of x that gives an area of 54 cm^2.



Area = $\ell \times w$

9. Write a quadratic equation in factored form for each situation.

a) The roots of the equation are 5 and 4.

b) The roots of the equation are -2 and 3.

10. a) Write a quadratic equation in the form $ax^2 + bx + c = 0$ with roots of 6 and -7.

b) What would happen to the roots if you multiplied both sides of the equation in part a) by 3? Explain.

15. For the equation $3n^2 = 15n$, Chris suggested dividing both sides by $3n$, leaving $n = 5$. Are there any other values that satisfy this equation? What is wrong with Chris's method? What is a more appropriate method?

11. Write a quadratic equation with roots of $\frac{2}{3}$ and $-\frac{4}{5}$ in the form $ax^2 + bx + c = 0$, where a, b, and c are integers.

Answers

8. 3.5 cm

9. a) $(x - 5)(x - 4) = 0$ b) $(x + 2)(x - 3) = 0$

10. a) $x^2 + x - 42 = 0$

b) the roots remain the same because the quadratic equation is equivalent to $x^2 + x - 42 = 0$ and will have the same factors.

15. $n = 0$ will also satisfy the equation. If Chris wants to divide out a common factor, it should not contain any variables. Chris should subtract $15n$ from both sides of the equation by 3 and then solve by factoring.

11. $15x^2 + 2x - 8 = 0$

8. $54 = \ell \times w$

$54 = (x + 10)(2x - 3)$

$54 = 2x^2 - 3x + 20x - 30$

$0 = 2x^2 - 3x + 20x - 30 - 54$

$0 = 2x^2 + 17x - 84$

$0 = 2x^2 + 24x - 7x - 84$

$0 = 2x(x + 12) - 7(x + 12)$

$0 = (x + 12)(2x - 7)$

$x + 12 = 0$ or $2x - 7 = 0$

$x = -12$ $2x = 7$

$x = \frac{7}{2}$

$\therefore x = \frac{7}{2}$ is the only solution (because $x = -12$ leads to negative length)

$ac = 2x - 84$

$= -168$

$b = 17$

$24x - 7 = -168$

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#9 "roots" = zeros = 5, 4

Factored form $\Rightarrow y = a(x-r)(x-s)$

a) $y = a(x-5)(x-4)$

b) roots = -2 and 3

Factored: $y = a(x+2)(x-3)$

#10. $y = (x-6)(x+7) = 0$

$x^2 + 7x - 6x - 42 = 0$

a) $x^2 + x - 42 = 0$

b) $3(x^2+x-42) = 3 \times 0$

$3(x^2+x-42) = 0$

$3(x-6)(x+7) = 0$

$x = 6, -7$

No they still have same answer.

#15. $\frac{3n^2}{3n} = \frac{15n}{3n}$ (Chris suggested)

$n = 5$ (one solution)

$3n^2 = 15n$

$3n^2 - 15n = 0$ → $3n(n-5) = 0$

$3n = 0$ or $n-5 = 0$

$n = 0$ $\quad n = 5$