Name Key Date Pd

Algebra 1 Quadratic Review WS

Solve by Factoring

1.) $x^2 - 64 = 0$

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

$x+8=0$ $\quad x-8=0$

$x=-8$ $\quad x=8$

2.) $x^2 - 6x - 16 = 0$

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

$x-8=0$ $\quad x+2=0$

$x=8$ $\quad x=-2$

3.) $x^2 + 3x = 40$

$x^2+3x-40=0$

$(x+8)(x-5)=0$

$x+8=0$ $\quad x-5=0$

$x=-8$ $\quad x=5$

4.) $2x^2+3x+1=0$

$a \cdot c$: 2, $+2$, $+1$, 3, b

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

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

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

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

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

5.) $x^2 - 100 = 0$

$(x+10)(x-10)=0$

$x=\pm 10$

6.) $x^2 + 6x = 0$

$x(x+6)=0$

$x=0$ $\quad x+6=0$

$x=-6$

Solve by Square Roots:

7.) $\sqrt{x^2}=\sqrt{64}$

$x=\pm 8$

8.) $\frac{4x^2}{4}=\frac{81}{4}$

$\sqrt{x^2}=\sqrt{\frac{81}{4}}$

$x=\pm\frac{9}{2}$

9.) $x^2+7=-300$

$-7 \quad -7$

$\sqrt{x^2}=\sqrt{-307}$

0 in Alg 1

now we will have a solution

10.) $\sqrt{(x-5)^2}=\sqrt{36}$

$x-5=\pm 6$

$+5 \quad +5$

$x=5\pm 6$

$x=5+6=11$

$x=5-6=-1$

Solve by using the quadratic formula.

11. $x^2 + 3x + 2 = 0$ $\quad a=1 \quad b=3 \quad c=2$

$x=\frac{-3\pm\sqrt{(3)^2-4(1)(2)}}{2(1)}$

$x=\frac{-3\pm\sqrt{9-8}}{2}$ $\quad x=-1,-2$

$=\frac{-3\pm\sqrt{1}}{2}$

$=\frac{-3\pm 1}{2}=\frac{-3+1}{2}\ \frac{-2}{2}=-1 \quad \frac{-3-1}{2}\ \frac{-4}{2}=-2$

12. $4x^2 - 8x = 1$ $\quad a=4 \quad b=-8$

$-1 \quad -1 \quad c=-1$

$4x^2-8x-1=0$

$x=\frac{-(-8)\pm\sqrt{(-8)^2-4(4)(-1)}}{2(4)}$

$=\frac{8\pm\sqrt{64+16}}{8}$

$=\frac{8\pm\sqrt{80}}{8}\cdot\frac{8\pm 4\sqrt{5}}{8_2}$

$x=\frac{2\pm\sqrt{5}}{2}$

13. $x^2 + 8x = 0$ $\quad a=1 \quad b=8 \quad c=0$

$x=\frac{-8\pm\sqrt{(8)^2-4(1)(0)}}{2(1)}$

$=\frac{-8\pm\sqrt{64-0}}{2}$

$=\frac{-8\pm 8}{2}$ $\quad \frac{-8+8}{2}=\frac{0}{2}$ $\quad \frac{-8-8}{2}=\frac{-16}{2}$

$x=0,-8$

Solve each equation any way you want. Show your work.

14. $x^2 + 11x + 18 = 0$

$(x+9)(x+2)=0$

$x+9=0 \quad x+2=0$

$x=-9 \quad x=-2$

15. $x^2 + 2x + 1 = 15$

$a=1, b=2, c=-14$

$-15 \quad -15$

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

$x=\frac{-2\pm\sqrt{(2)^2-4(1)(-14)}}{2(1)}=\frac{-2\pm\sqrt{4+56}}{2}=\frac{-2\pm\sqrt{60}}{2}=\frac{-2\pm2\sqrt{15}}{2}=-1\pm\sqrt{15}$

16. $7x^2 - 9x + 1 = 0$

$a=7, b=-9, c=1$

$x=\frac{-(-9)\pm\sqrt{(-9)^2-4(7)(1)}}{2(7)}=\frac{9\pm\sqrt{81-28}}{14}=\frac{9\pm\sqrt{53}}{14}$

17. $\sqrt{(x+2)^2}=\sqrt{36}$

$x+2=\pm6$

$-2 \quad -2$

$x=-2\pm6$ ($-2+6$, $-2-6$)

$x=4, -8$

18. $x^2 - 10x + 25 = 0$

$(x-5)(x-5)=0$

$x-5=0 \quad x-5=0$

$x=5$

19. $x^2 + 3x + 7 = 0$

$a=1, b=3, c=7$

$x=\frac{-3\pm\sqrt{(3)^2-4(1)(7)}}{2(1)}=\frac{-3\pm\sqrt{9-28}}{2}=\frac{-3\pm\sqrt{-19}}{2}=\emptyset$ For now!

20. $\sqrt{x^2}=\sqrt{36}$

$x=\pm6$

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

$a=1, b=-6, c=2$

$x=\frac{-(-6)\pm\sqrt{(-6)^2-4(1)(2)}}{2(1)}=\frac{6\pm\sqrt{36-8}}{2}=\frac{6\pm\sqrt{28}}{2}=\frac{6\pm2\sqrt{7}}{2}$

$x=3\pm\sqrt{7}$

22. $x^2 - 5x + 4 = 0$

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

$x-4=0 \quad x-1=0$

$x=4 \quad x=1$

REASONING:

20.) Explain why $x^2 = -81$ DOES NOT have a real solution.

$\pm\sqrt{-81}$ = an imaginary # $\pm9i$

21.) Which method can't you use to solve this problem? $x^2 - 47 = 0$

Circle one: Factoring (Completing the Square) Quadratic Formula

Explain why: no "b" for $(\frac{b}{2})^2$

22.) Which method can't you use to solve this problem? $x^2 + 7x = 0$

Circle one: Factoring Completing the Square Quadratic Formula

Explain why: none!

23.) Which method can you use to solve all quadratic equations?

Circle one: Factoring Completing the Square Quadratic Formula

Explain why: Always works! Always an a, b, c!

24.) What are the **two mistakes** in setting up the quadratic formula?

Solve: $2x^2 - x - 6 = 0$

$$x = \frac{-1 \pm \sqrt{(-1)^2 - 4(2)(6)}}{2(2)}$$

$a = 2$
$b = -1$
$c = -6$

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

25.) Factor the following: NOT solve!

a. $x^2 - 12x + 32$

$(x-8)(x-4)$

b. $6x^2 + 13x + 6$

$(6x^2 + 9x) + (4x + 6)$

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

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

$(2x+3)^2$

a·c: 36; +9, +4; 13; b

c. $x^2 - 25$ $a^2 - b^2 = (a+b)(a-b)$

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

d. $12x^2 - x - 6$

e. $6x^2 + 27x - 15$

$3(2x^2 + 9x - 5)$

$3[(2x^2 + 10x) - 1x - 5]$

$3[2x(x+5) - 1(x+5)]$

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

a·c: −10; +10, −1; 9; b

26.) Clean up the following:

a. $\frac{4\ \ 2}{-8 \pm 4\sqrt{2}}{2\ \ 1} = -4 \pm 2\sqrt{2}$

b. $\frac{1\ \ 2}{5 \pm 10\sqrt{3}}{10\ \ 2} = \frac{1 \pm 2\sqrt{3}}{2}$

27.) Simplify the following:

a. $\sqrt{12} + \sqrt{48}$

$\sqrt{4}\sqrt{3} \quad \sqrt{16}\sqrt{3}$

$2\sqrt{3} + 4\sqrt{3}$

$6\sqrt{3}$

b. $\sqrt{80}$

$\sqrt{16}\sqrt{5}$

$4\sqrt{5}$

c $4\sqrt{20}$

$4\sqrt{5}$

$8\sqrt{5}$

d. $(\sqrt{8})(\sqrt{9})$

$\sqrt{4}\sqrt{2} \quad \sqrt{3}\sqrt{3}$

$(2\sqrt{2})(3)$

$6\sqrt{2}$

e. $3 + \sqrt{8} - \sqrt{2} + 3\sqrt{5} - 4 - 3\sqrt{5}$

$\sqrt{4}\sqrt{2}$

$3 + 2\sqrt{2} - \sqrt{2} + 3\sqrt{5} - 4 - 3\sqrt{5}$

$-1 + \sqrt{2}$

f. $(3\sqrt{2} + 5)(6\sqrt{2} - 1)$

$18\sqrt{4} - 3\sqrt{2} + 30\sqrt{2} - 5$

$\sqrt{2}\sqrt{2}$

$36 + 27\sqrt{2} - 5$

$31 + 27\sqrt{2}$

g. $\sqrt{-169}$

$\sqrt{-1}\cdot\sqrt{169}$

$13i$

h. $\sqrt{-60}$

$\sqrt{-1}\cdot\sqrt{4}\sqrt{15}$

$2i\sqrt{15}$

i. $(\sqrt{-8})(\sqrt{-3})$

$\sqrt{-1}\sqrt{4}\sqrt{2}\ \sqrt{-1}\sqrt{3}$ $\quad i^2 = -1$

$(2i\sqrt{2})(i\sqrt{3})$

$2i^2\sqrt{6}$

$-2\sqrt{6}$

j. $(\sqrt{5})^2 =$

5

k. $(2\sqrt{3})^2 =$

$(2^2)(\sqrt{3})^2$

$4(3)$

12

l. $(\sqrt{-9})^2 =$

-9

m. $(\sqrt{-40})^2 =$

-40

28.) Match the following quadratics with their roots/solutions/zeros/x-intercepts:

e $x^2 + 5x + 4$ $(x+4)(x+1)$

C $x^2 + 5x - 4$ $a=1\ b=5\ c=-4$

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

d $x^2 - 5x - 4$ $a=1\ b=-5\ c=-4$

b $\sqrt{(x+5)^2} = \sqrt{4}$

$x = \pm 2 - 5$

a. $x = 4, 1$

b. $x = -3, -7$

c. $x = \frac{-5 \pm \sqrt{41}}{2}$

d. $x = \frac{5 \pm \sqrt{41}}{2}$

e. $x = -4, -1$

$x = \frac{-5 \pm \sqrt{(5)^2 - 4(1)(4)}}{2(1)}$

$= \frac{-5 \pm \sqrt{25 + 16}}{2}$

$= \frac{-5 \pm \sqrt{41}}{2}$