Name: Key HW#_____ Date:_____

REVIEW FOR UNIT 8 TEST

1. The roots of the equation $2x^2 - 8x = 0$ are

   (1) -2 and 2 (3) 0 and -4

   (2) $0, -2$ and 2 (4) 0 and 4

$2x^2 - 8x = 0$

$2x(x-4)=0$

$2x=0 \quad | \quad x-4=0$

$\frac{2x}{2}=\frac{0}{2} \quad | \quad +4 \; +4$

$x=0 \quad | \quad x=4$

2. The solutions of the equation $x^2 = 100$ are

   (1) -50 and 50 (3) -10 and 10

   (2) -25 and -25 (4) -5 and -5

$\sqrt{x^2} = \sqrt{100}$

$x = \pm 10$

3. What is the solution of $x^2 + 64 = 0$

   (1) -5 (3) ± 8

   (2) 8 (4) no solutions

↖ can't be factored

4. What is the solution set of the equation $(x-2)(x-a) = 0$?

$x=2 \quad | \quad x=a$

   1) -2 and a

   2) -2 and $-a$

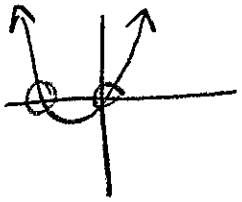
   3) 2 and a

   4) 2 and $-a$

5. How many real solutions does the equation $x^2 + 4x + 1 = 0$

   (1) 0 (3) 2

   (2) 1 (4) 3



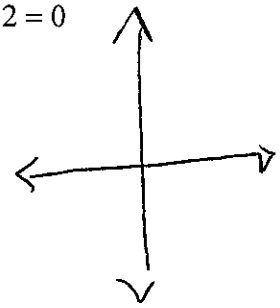
6. What is the nature of the roots of $6x^2 - 3x - 12 = 0$

   1) real, rational, and equal

   2) real, rational, and unequal

   3) real, irrational, and unequal

   4) imaginary



7. The x-intercepts of $x^2 = 16x - 28$ are

$-16x+28 \quad -16x+28$

$x^2 - 16x + 28 = 0$

$(x-14)(x-2)=0$

$x=14 \quad | \quad x=2$

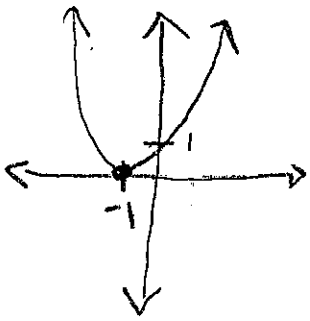
   1) -2 and -14

   2) 2 and 14

   3) -4 and -7

   4) 4 and 7

8. What is the nature of the roots of $f(x) = x^2 + 2x + 1$



1) real, rational, and equal
2) real, rational, and unequal
3) real, irrational, and unequal
4) imaginary

9. If the roots of a quadratic equation are -2 and 3, the equation can be written as

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

10. Which value of c will make the roots of the equation $x^2 - 8x + c = 0$ real and equal?

1) −16
2) −4
3) 0
4) 16

$\frac{8}{2} = 4^2$

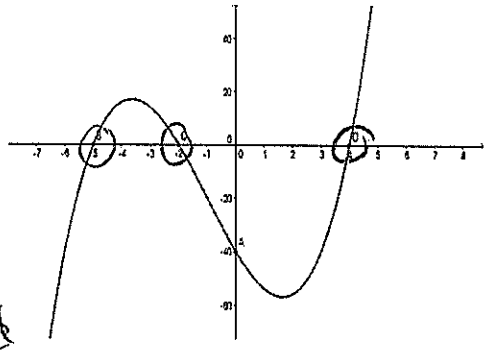
11. Which expression has -5 and 3 as its roots?

1) $x^2 + 2x + 15 = 0$
2) $x^2 - 2x - 15 = 0$
3) $x^2 - 2x + 15 = 0$
4) $x^2 + 2x - 15 = 0$

$(x-5)(x+3)=0$ | $x=5 \quad x=-3$

$(x+5)(x-3)=0$ | $x=-5 \quad x=3$

12. The graph f(x) is shown to the right. The roots of the function are



1) {2,4,5}
2) {-5,-4,-2}
3) {-5,0,4}
4) {-5,-2,4 }

13. Which expression gives the solutions of $-5 + 2x^2 = -6x$ ← put in standard form

1) $x = \frac{2 \pm \sqrt{4-(4)(6)(-5)}}{12}$
2) $x = \frac{-5 \pm \sqrt{25-(4)(2)(6)}}{-10}$
3) $x = \frac{-6 \pm \sqrt{36-(4)(2)(-5)}}{4}$
4) $x = \frac{6 \pm \sqrt{36-(4)(2)(5)}}{4}$

$-5 + 2x^2 = -6x$
$+6x \quad +6x$
$2x^2 + 6x - 5 = 0$

$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(2)(-5)}}{2(2)}$

14. The method of completing the square was used to solve the equation $2x^2 - 12x + 6 = 0$. Which equation is a correct step when using this method?

1) $(x-3)^2 = 6$
2) $(x-3)^2 = -6$
3) $(x-3)^2 = 3$
4) $(x-3)^2 = -3$

$\frac{2}{2}\ \frac{2}{2}\ \frac{2}{2}\ \frac{2}{2}$ $\quad \frac{6}{2} = 3$

$x^2 - 6x + 3 = 0$
$\quad -3 \quad -3$
$x^2 - 6x + \boxed{3^2} = 3 + \boxed{3^2}$
$(x-3)^2 = 6$

15. The solution set of $\frac{x+5}{4} = \frac{5}{x-3}$ is

1) $\{-7,-5\}$
2) $\{7,-5\}$
3) $\{-7,5\}$
4) $\{7,5\}$

$(x+5)(x-3) = 20$
$x^2 - 3x + 5x - 15 = 20$
$\quad -20 \quad -20$
$x^2 + 2x - 35 = 0$
$(x+7)(x-5) = 0$
$x = -7 \mid x = 5$

16. The roots of the equation $2x^2 + 7x - 3 = 0$ are

1) $-\frac{1}{2}$ and -3
2) $\frac{1}{2}$ and 3
3) $\frac{-7 \pm \sqrt{73}}{4}$
4) $\frac{7 \pm \sqrt{73}}{4}$

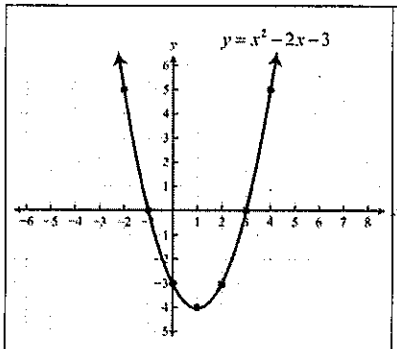
$2x^2 + 7x - 3 = 0$
$x = \frac{-7 \pm \sqrt{7^2 - 4(2)(-3)}}{2(2)}$

17. Put in simplest radical form

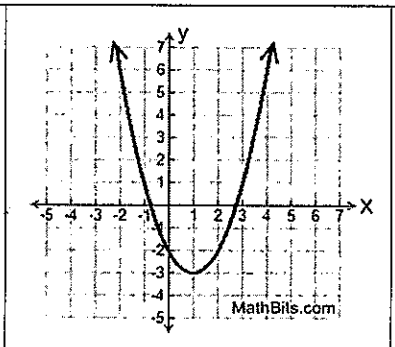
a. $\frac{-5 \pm 10\sqrt{35}}{5 \quad 5}$ $\quad \boxed{-1 \pm 2\sqrt{35}}$

b. $\frac{4 \pm \sqrt{32}}{8 \quad 8}$ $\quad \frac{4 \pm \sqrt{16}\sqrt{2}}{8} = \frac{4 \pm 4\sqrt{2}}{8} = \boxed{\frac{1 \pm \sqrt{2}}{2}}$

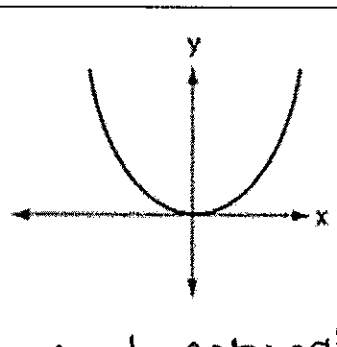
18. Describe the roots for each quadratic function.



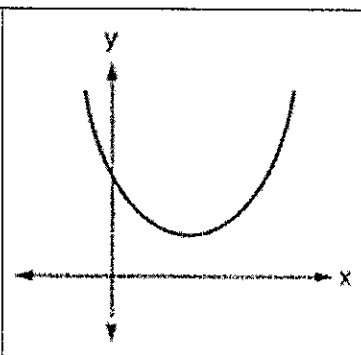
real, rational unequal



real, irrational unequal



real, rational equal



imaginary

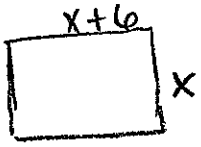
19. The product of two consecutive negative EVEN integers is 168. What are the integers?

legend
x = 1st CEI
$x+2$ = 2nd CEI

$x(x+2)=168$
$x^2+2x=168$
$-168\ -168$
$x^2+2x-168=0$
$(x+14)(x-12)=0$
$x=-14 \quad x=12$ Reject

$x=-14$
$x+2=-12$

20. The length of a rectangle is six more than the width. If the area is twenty-one, what are the dimensions of the rectangle, to the nearest tenth? **(Use completing the square)**



let x = width = 2.5
let $x+6$ = length = 8.5

$x(x+6)=21$
$x^2+6x=21$
$\frac{6}{2}=3^2$
$x^2+6x+\boxed{3^2}=21+\boxed{3^2}$
$(x+3)(x+3)=30$
$\sqrt{(x+3)^2}=\sqrt{30}$
$x+3=\pm\sqrt{30}$
$-3\ \ -3$
$x=-3\pm\sqrt{30}$

$x=-3+\sqrt{30}$
$\boxed{x=2.5}$

$x=-3-\sqrt{30}$
$x=-8.5$ ← reject!

21. A ball is thrown into the air with an initial upward velocity of 60 ft/s. Its height h in feet after t seconds is given by the function $h=-16t^2+60t+6$. After how many seconds will the ball hit the ground? Round to the nearest tenth of a second.

ball will hit the ground when $h=0$.

$a=-16$
$b=60$
$c=6$

$0=-16t^2+60t+6$
$t=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$
$t=\frac{-(60)\pm\sqrt{(60)^2-4(-16)(6)}}{2(-16)}$
$t=\frac{-60\pm\sqrt{3984}}{-32}$

Reject -0.1 sec
3.8 sec