Algebra 2 - Midterm Exam

Name KEY

Unit 2 Review

Date _____ Period ____

Answer the question below.

1) How can you tell where the zeros of a function are by looking at its graph?

THE ZEROS OF A FUNCTION ARE ITS X-INTERCEPTS.

Solve each equation by taking square roots.

2) $6 + 49r^2 = 55$

$-6 \quad -6$

$49r^2 = 49$

$\frac{49}{49} \quad \frac{49}{49}$

$r^2 = 1$

$r = \pm 1$

3) $6n^2 - 6 = 144$

$+6 \quad +6$

$\frac{6n^2}{6} = \frac{150}{6}$

$n^2 = 25$

$n = \pm\sqrt{25}$

$n = \pm 5$

4) $6n^2 - 7 = 455$

$+7 \quad +7$

$\frac{6n^2}{6} = \frac{462}{6}$

$n^2 = 77$

$n = \pm\sqrt{77}$

5) $10a^2 + 6 = 406$

$-6 \quad -6$

$\frac{10a^2}{10} = \frac{400}{10}$

$a^2 = 40$

$a = \pm\sqrt{40}$

$a = \pm\sqrt{4} \cdot \sqrt{10}$

$a = \pm 2\sqrt{10}$

6) $6n^2 + 3 = -39$

$-3 \quad -3$

$\frac{6n^2}{6} = \frac{-42}{6}$

$n^2 = -7$

$n = \pm\sqrt{-7}$

$n = \pm i\sqrt{7}$

7) $3n^2 + 10 = -14$

$-10 \quad -10$

$\frac{3n^2}{3} = \frac{-24}{3}$

$n^2 = -8$

$n = \pm\sqrt{-8}$

$n = \pm\sqrt{-4} \cdot \sqrt{2}$

$n = \pm 2i\sqrt{2}$

Solve each equation by factoring.

8) $p^2 + 8p + 12 = 0$

$(p+6)(p+2)=0$

$p+6=0$ $\quad p+2=0$

$p=-6$ $\quad p=-2$

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

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

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

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

10) $n^2 - 6n + 13 = 8$

$-8 \quad -8$

$n^2-6n+5=0$

$(n-5)(n-1)=0$

$n-5=0$ $\quad n-1=0$

$n=5$ $\quad n=1$

11) $x^2 = -8x - 7$

$+8x+7 \quad +8x+7$

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

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

$x+7=0$ $\quad x+1=0$

$x=-7$ $\quad x=-1$

12) $3x^2 + 4x - 4 = 0$

$3 \cdot -4 = -12$

1 12
2 6
3 4

$(3x^2-2x)+(6x-4)=0$

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

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

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

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

13) $5n^2 + 8n - 21 = 0$

$5 \cdot -21 = -105$

1 105
3 35
5 21
7 15

$(5n^2-7n)+(15n-21)=0$

$n(5n-7)+3(5n-7)=0$

$(n+3)(5n-7)=0$

$n+3=0$ $\quad 5n-7=0$

$n=-3$ $\quad 5n=7$

$n=7/5$

14) $2n^2 - 3n - 16 = 4$

$-4 \quad -4$

$2n^2-3n-20=0$

$2 \cdot -20 = -40$

1 40
2 20
4 10
5 8

$(2n^2+5n)+(-8n-20)=0$

$n(2n+5)-4(2n+5)=0$

$(n-4)(2n+5)=0$

$n-4=0$ $\quad 2n+5=0$

$n=4$ $\quad 2n=-5$

$n=-5/2$

15) $2r^2 - 9r = -10$

$+10 \quad +10$

$2r^2-9r+10=0$

$2 \cdot 10 = 20$

1 20
2 10
4 5

$(2r^2-4r)+(-5r+10)=0$

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

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

$2r-5=0$ $\quad r-2=0$

$2r=5$ $\quad r=2$

$r=5/2$

16) Write the formula used to find the discriminant.

b^2-4ac

17) What do you know about the zeros of a function if its discriminant is:

a) a positivie number? THERE ARE 2 X-INTERCEPTS +U

b) a negative number? THERE ARE 0 X-INTERCEPTS (2 IMAGINARY X-INTERCEPTS) +U

c) zero? THERE IS 1 X-INTERCEPT +U

Find the discriminant of each quadratic equation then state the number and type of solutions.

18) $-9n^2 - 10n - 1 = 0$ ✓

a: -9 b: -10 c: -1

$b^2 - 4ac$

$= (-10)^2 - (4 \cdot -9 \cdot -1)$

$= 100 - 36$

$= \boxed{64}$ 2 REAL SOLUTIONS

19) $-9n^2 + 6n - 4 = -3$

$+3 \quad +3$

$-9n^2 + 6n - 1 = 0$ ✓

a: -9 b: 6 c: -1

$b^2 - 4ac$

$= 6^2 - (4 \cdot -9 \cdot -1)$

$= 36 - 36$

$= \boxed{0}$ 1 REAL SOLUTION

20) $3m^2 = -7m - 2$

$+7m \quad +2 \quad +7m \quad +2$

$3m^2 + 7m + 2 = 0$ ✓

a: 3 b: 7 c: 2

$b^2 - 4ac$

$= 7^2 - (4 \cdot 3 \cdot 2)$

$= 49 - 24$

$= \boxed{25}$ 2 REAL SOLUTIONS

21) $7v^2 + 5 = -6v$

$+6v \quad +6v$

$7v^2 + 6v + 5 = 0$ ✓

a: 7 b: 6 c: 5

$b^2 - 4ac$

$= 6^2 - (4 \cdot 7 \cdot 5)$

$= 36 - 140$

$= \boxed{-104}$ 2 IMAGINARY SOLUTIONS

22) Write the Quadratic Formula.

$$X = \frac{-b \pm \sqrt{b^2 - (4ac)}}{2a}$$