Algebra 2 Name_____ ID: 1

Assignment

Date_____ Period____

Use the discriminant to determine the number of real solutions to each equation.

1) $3k^2 + 3k + 6 = 2$

2) $4a^2 + 8a - 5 = -9$

3) $8n^2 + n = -3$

4) $7x^2 + 4x = 8$

5) $-2a^2 - 5a + 6 = 3$

6) $8n^2 + 2n + 9 = 9$

7) $3n^2 - 4n + 17 = 7$

8) $-9x^2 + 6x + 7 = 8$

9) $-3n^2 + 8n - 5 = -6$

10) $-n^2 - 4n - 13 = -9$

Solve each equation with the quadratic formula.

11) $12x^2 = 5x + 20$

A) $\left\{\frac{5 + i\sqrt{935}}{24}, \frac{5 - i\sqrt{935}}{24}\right\}$

B) $\left\{\frac{-5 + \sqrt{105}}{2}, \frac{-5 - \sqrt{105}}{2}\right\}$

C) $\left\{\frac{-5 + \sqrt{985}}{24}, \frac{-5 - \sqrt{985}}{24}\right\}$

D) $\left\{\frac{5 + \sqrt{985}}{24}, \frac{5 - \sqrt{985}}{24}\right\}$

12) $m^2 - 5m = 1$

A) $\left\{\frac{-5 + \sqrt{29}}{2}, \frac{-5 - \sqrt{29}}{2}\right\}$

B) $\left\{\frac{-5 + \sqrt{21}}{2}, \frac{-5 - \sqrt{21}}{2}\right\}$

C) $\left\{\frac{5 + \sqrt{29}}{2}, \frac{5 - \sqrt{29}}{2}\right\}$

D) $\left\{\frac{5 + \sqrt{21}}{2}, \frac{5 - \sqrt{21}}{2}\right\}$

13) $3v^2 + v = -2$

A) $\left\{\frac{-7 + i\sqrt{111}}{20}, \frac{-7 - i\sqrt{111}}{20}\right\}$

B) $\left\{\frac{-1 + \sqrt{737}}{16}, \frac{-1 - \sqrt{737}}{16}\right\}$

C) $\left\{\frac{1 + 7i\sqrt{15}}{16}, \frac{1 - 7i\sqrt{15}}{16}\right\}$

D) $\left\{\frac{-1 + i\sqrt{23}}{6}, \frac{-1 - i\sqrt{23}}{6}\right\}$

14) $11r^2 - 6 = -12r$

A) $\left\{\frac{-6 + \sqrt{102}}{11}, \frac{-6 - \sqrt{102}}{11}\right\}$

B) $\left\{\frac{2 + \sqrt{103}}{6}, \frac{2 - \sqrt{103}}{6}\right\}$

C) $\left\{\frac{11}{3}, -3\right\}$

D) $\left\{\frac{6 + \sqrt{102}}{11}, \frac{6 - \sqrt{102}}{11}\right\}$

15) $n^2 + 8n = -12$

A) $\{6, 2\}$

B) $\{4 + 2\sqrt{7}, 4 - 2\sqrt{7}\}$

C) $\{-2, -6\}$

D) $\left\{\frac{3 + i\sqrt{311}}{20}, \frac{3 - i\sqrt{311}}{20}\right\}$

16) $8x^2 = 6x - 8$

A) $\left\{\frac{5 + 4i\sqrt{6}}{11}, \frac{5 - 4i\sqrt{6}}{11}\right\}$

B) $\left\{\frac{5 + \sqrt{146}}{11}, \frac{5 - \sqrt{146}}{11}\right\}$

C) $\left\{\frac{3 + i\sqrt{55}}{8}, \frac{3 - i\sqrt{55}}{8}\right\}$

D) $\left\{\frac{3 + \sqrt{73}}{8}, \frac{3 - \sqrt{73}}{8}\right\}$

17) $5x^2 + 12 = -x$

A) $\left\{\frac{5 + \sqrt{17}}{2}, \frac{5 - \sqrt{17}}{2}\right\}$

B) $\left\{\frac{-1 + i\sqrt{239}}{10}, \frac{-1 - i\sqrt{239}}{10}\right\}$

C) $\left\{1, \frac{2}{3}\right\}$

D) $\left\{2, -\frac{11}{6}\right\}$

18) $10k^2 - 15 = -10k$

A) $\left\{\frac{-2 + \sqrt{22}}{3}, \frac{-2 - \sqrt{22}}{3}\right\}$

B) $\left\{\frac{1 + \sqrt{7}}{2}, \frac{1 - \sqrt{7}}{2}\right\}$

C) $\left\{\frac{-1 + \sqrt{33}}{4}, \frac{-1 - \sqrt{33}}{4}\right\}$

D) $\left\{\frac{-1 + \sqrt{7}}{2}, \frac{-1 - \sqrt{7}}{2}\right\}$

19) $3m^2 + 5 = 7m$

A) $\left\{\frac{1 + \sqrt{129}}{16}, \frac{1 - \sqrt{129}}{16}\right\}$

B) $\left\{\frac{7 + i\sqrt{11}}{6}, \frac{7 - i\sqrt{11}}{6}\right\}$

C) $\left\{\frac{1 + i\sqrt{15}}{2}, \frac{1 - i\sqrt{15}}{2}\right\}$

D) $\left\{\frac{-1 + i\sqrt{127}}{16}, \frac{-1 - i\sqrt{127}}{16}\right\}$

20) $10m^2 = -7m + 8$

A) $\left\{\frac{3 + 2i\sqrt{3}}{6}, \frac{3 - 2i\sqrt{3}}{6}\right\}$

B) $\left\{\frac{-7 + 3\sqrt{41}}{20}, \frac{-7 - 3\sqrt{41}}{20}\right\}$

C) $\left\{\frac{3 + \sqrt{30}}{6}, \frac{3 - \sqrt{30}}{6}\right\}$

D) $\left\{\frac{-3 + 2i\sqrt{3}}{6}, \frac{-3 - 2i\sqrt{3}}{6}\right\}$

21) $3x^2 - 15 = 8x$

A) $\left\{\frac{2}{3}, -\frac{3}{2}\right\}$

B) $\left\{\frac{1 + 2i\sqrt{6}}{5}, \frac{1 - 2i\sqrt{6}}{5}\right\}$

C) $\left\{\frac{4 + i\sqrt{29}}{3}, \frac{4 - i\sqrt{29}}{3}\right\}$

D) $\left\{\frac{4 + \sqrt{61}}{3}, \frac{4 - \sqrt{61}}{3}\right\}$

22) $2a^2 + 12a = 3$

A) $\{-2, -6\}$

B) $\{6 + \sqrt{39}, 6 - \sqrt{39}\}$

C) $\left\{\frac{-6 + \sqrt{30}}{2}, \frac{-6 - \sqrt{30}}{2}\right\}$

D) $\left\{\frac{-6 + \sqrt{42}}{2}, \frac{-6 - \sqrt{42}}{2}\right\}$

23) $6a^2 - 5a = 1$

A) $\left\{1, -\frac{1}{6}\right\}$

B) $\left\{\frac{-4 + 2i\sqrt{10}}{7}, \frac{-4 - 2i\sqrt{10}}{7}\right\}$

C) $\left\{\frac{1}{6}, -1\right\}$

D) $\left\{\frac{5 + \sqrt{31}}{12}, \frac{5 - \sqrt{31}}{12}\right\}$

24) $11a^2 + 9a = -4$

A) $\left\{\frac{1 + i\sqrt{395}}{18}, \frac{1 - i\sqrt{395}}{18}\right\}$

B) $\left\{\frac{1 + \sqrt{397}}{18}, \frac{1 - \sqrt{397}}{18}\right\}$

C) $\left\{\frac{-9 + i\sqrt{95}}{22}, \frac{-9 - i\sqrt{95}}{22}\right\}$

D) $\left\{\frac{4 + \sqrt{14}}{2}, \frac{4 - \sqrt{14}}{2}\right\}$

25) $2r^2 = 13 + 12r$

A) $\{1, -13\}$

B) $\left\{\frac{6 + \sqrt{62}}{2}, \frac{6 - \sqrt{62}}{2}\right\}$

C) $\{13, -1\}$

D) $\left\{\frac{7 + \sqrt{313}}{22}, \frac{7 - \sqrt{313}}{22}\right\}$

26) $2p^2 - 3p = -3$

A) $\left\{\frac{-3 + i\sqrt{3}}{2}, \frac{-3 - i\sqrt{3}}{2}\right\}$

B) $\left\{\frac{3 + \sqrt{33}}{4}, \frac{3 - \sqrt{33}}{4}\right\}$

C) $\left\{\frac{3 + i\sqrt{15}}{4}, \frac{3 - i\sqrt{15}}{4}\right\}$

D) $\left\{\frac{1 + \sqrt{5}}{4}, \frac{1 - \sqrt{5}}{4}\right\}$

27) $12a^2 + 6a = -1$

A) $\left\{\frac{-3 + i\sqrt{3}}{12}, \frac{-3 - i\sqrt{3}}{12}\right\}$

B) $\left\{2 + \sqrt{2}, 2 - \sqrt{2}\right\}$

C) $\left\{\frac{-1 + \sqrt{37}}{3}, \frac{-1 - \sqrt{37}}{3}\right\}$

D) $\{1\}$

28) $6a^2 - 10 = -4a$

A) $\left\{\frac{-6 + \sqrt{113}}{22}, \frac{-6 - \sqrt{113}}{22}\right\}$

B) $\left\{\frac{17}{6}, -1\right\}$

C) $\left\{\frac{-3 + \sqrt{86}}{11}, \frac{-3 - \sqrt{86}}{11}\right\}$

D) $\left\{1, -\frac{5}{3}\right\}$

29) $2x^2 - 51 = -11x$

A) $\left\{3, -\frac{17}{2}\right\}$

B) $\left\{\frac{-11 + i\sqrt{287}}{4}, \frac{-11 - i\sqrt{287}}{4}\right\}$

C) $\left\{\frac{-11 + \sqrt{223}}{4}, \frac{-11 - \sqrt{223}}{4}\right\}$

D) $\left\{\frac{7 + i\sqrt{15}}{4}, \frac{7 - i\sqrt{15}}{4}\right\}$

30) $3x^2 + 4 = 3x$

A) $\left\{\frac{-3 + \sqrt{57}}{6}, \frac{-3 - \sqrt{57}}{6}\right\}$

B) $\left\{\frac{3 + i\sqrt{39}}{6}, \frac{3 - i\sqrt{39}}{6}\right\}$

C) $\left\{\frac{3 + i\sqrt{3}}{6}, \frac{3 - i\sqrt{3}}{6}\right\}$

D) $\left\{\frac{7 + 3i\sqrt{39}}{20}, \frac{7 - 3i\sqrt{39}}{20}\right\}$

Simplify.

31) $(-1 - 8i)^2$

32) $(3i)(-6i)(3 - i)$

33) $(4 - 4i) - (7 - 4i)$

34) $3(-7 - 8i) - (i)(5 + 2i)$

35) $(-7 - 8i)(-4 - 4i)$

36) $(2i)(i)(1 - 4i)$

37) $(-8 - 7i) + (-3 - 2i)$

38) $(-6i)(8i)(6 + 2i)$

39) $(3 - i) - (-6 - 3i)$

40) $(3 + i)(-4 + 3i)$

41) $(-1 - 5i)(5 + i)$

42) $(-5i)(6 + 3i) - (3i)(-7i)$

43) $(4 + 6i) - (-5 - 6i)$

44) $(5 + 2i)(-3 + 6i)$

45) $(5i) + (-8 + 7i) - (i)$

46) $(-6 - 8i)(8 - 7i)$

47) $(-3 + 2i)(5 + 5i)$

48) $(1 - 3i) + (2 - 7i)$

49) $(-1 - 8i) - (-6 - 5i)$

50) $(-8 + 3i) + (-5 + 8i)$

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Assignment

Date_____ Period____

Use the discriminant to determine the number of real solutions to each equation.

1) $3k^2 + 3k + 6 = 2$
None

2) $4a^2 + 8a - 5 = -9$
One

3) $8n^2 + n = -3$
None

4) $7x^2 + 4x = 8$
Two

5) $-2a^2 - 5a + 6 = 3$
Two

6) $8n^2 + 2n + 9 = 9$
Two

7) $3n^2 - 4n + 17 = 7$
None

8) $-9x^2 + 6x + 7 = 8$
One

9) $-3n^2 + 8n - 5 = -6$
Two

10) $-n^2 - 4n - 13 = -9$
One

Solve each equation with the quadratic formula.

11) $12x^2 = 5x + 20$

A) $\left\{\frac{5 + i\sqrt{935}}{24}, \frac{5 - i\sqrt{935}}{24}\right\}$

B) $\left\{\frac{-5 + \sqrt{105}}{2}, \frac{-5 - \sqrt{105}}{2}\right\}$

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*C) $\left\{\frac{3 + i\sqrt{15}}{4}, \frac{3 - i\sqrt{15}}{4}\right\}$

D) $\left\{\frac{1 + \sqrt{5}}{4}, \frac{1 - \sqrt{5}}{4}\right\}$

27) $12a^2 + 6a = -1$

*A) $\left\{\frac{-3 + i\sqrt{3}}{12}, \frac{-3 - i\sqrt{3}}{12}\right\}$

B) $\left\{2 + \sqrt{2}, 2 - \sqrt{2}\right\}$

C) $\left\{\frac{-1 + \sqrt{37}}{3}, \frac{-1 - \sqrt{37}}{3}\right\}$

D) $\{1\}$

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A) $\left\{\frac{-6 + \sqrt{113}}{22}, \frac{-6 - \sqrt{113}}{22}\right\}$

B) $\left\{\frac{17}{6}, -1\right\}$

C) $\left\{\frac{-3 + \sqrt{86}}{11}, \frac{-3 - \sqrt{86}}{11}\right\}$

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29) $2x^2 - 51 = -11x$

*A) $\left\{3, -\frac{17}{2}\right\}$

B) $\left\{\frac{-11 + i\sqrt{287}}{4}, \frac{-11 - i\sqrt{287}}{4}\right\}$

C) $\left\{\frac{-11 + \sqrt{223}}{4}, \frac{-11 - \sqrt{223}}{4}\right\}$

D) $\left\{\frac{7 + i\sqrt{15}}{4}, \frac{7 - i\sqrt{15}}{4}\right\}$

30) $3x^2 + 4 = 3x$

A) $\left\{\frac{-3 + \sqrt{57}}{6}, \frac{-3 - \sqrt{57}}{6}\right\}$

*B) $\left\{\frac{3 + i\sqrt{39}}{6}, \frac{3 - i\sqrt{39}}{6}\right\}$

C) $\left\{\frac{3 + i\sqrt{3}}{6}, \frac{3 - i\sqrt{3}}{6}\right\}$

D) $\left\{\frac{7 + 3i\sqrt{39}}{20}, \frac{7 - 3i\sqrt{39}}{20}\right\}$

Simplify.

31) $(-1 - 8i)^2$

$-63 + 16i$

32) $(3i)(-6i)(3 - i)$

$54 - 18i$

33) $(4 - 4i) - (7 - 4i)$

-3

34) $3(-7 - 8i) - (i)(5 + 2i)$

$-19 - 29i$

35) $(-7 - 8i)(-4 - 4i)$

$-4 + 60i$

36) $(2i)(i)(1 - 4i)$

$-2 + 8i$

37) $(-8 - 7i) + (-3 - 2i)$

$-11 - 9i$

38) $(-6i)(8i)(6 + 2i)$

$288 + 96i$

39) $(3 - i) - (-6 - 3i)$

$9 + 2i$

40) $(3 + i)(-4 + 3i)$

$-15 + 5i$

41) $(-1 - 5i)(5 + i)$

$-26i$

42) $(-5i)(6 + 3i) - (3i)(-7i)$

$-6 - 30i$

43) $(4 + 6i) - (-5 - 6i)$

$9 + 12i$

44) $(5 + 2i)(-3 + 6i)$

$-27 + 24i$

45) $(5i) + (-8 + 7i) - (i)$

$-8 + 11i$

46) $(-6 - 8i)(8 - 7i)$

$-104 - 22i$

47) $(-3 + 2i)(5 + 5i)$

$-25 - 5i$

48) $(1 - 3i) + (2 - 7i)$

$3 - 10i$

49) $(-1 - 8i) - (-6 - 5i)$

$5 - 3i$

50) $(-8 + 3i) + (-5 + 8i)$

$-13 + 11i$