

Unit 5 – Mathematician – Scribe Partner Activity

Partner A: _____ Partner B: _____ Per: _____

Find the discriminant for the equation below. Then, state how many and what type of solutions the equation will have.

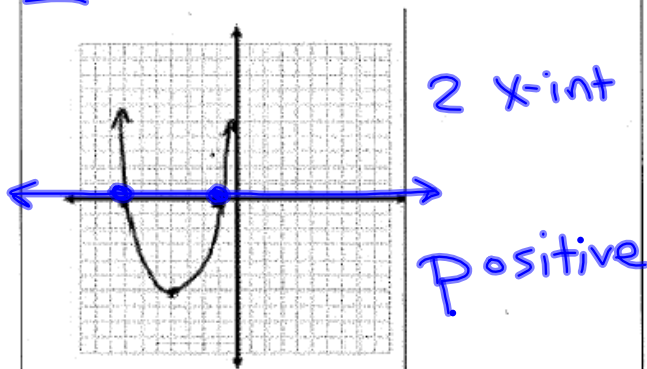
$$0 = 5x^2 + 20x + 3$$

340 2 Real
(Irrational)

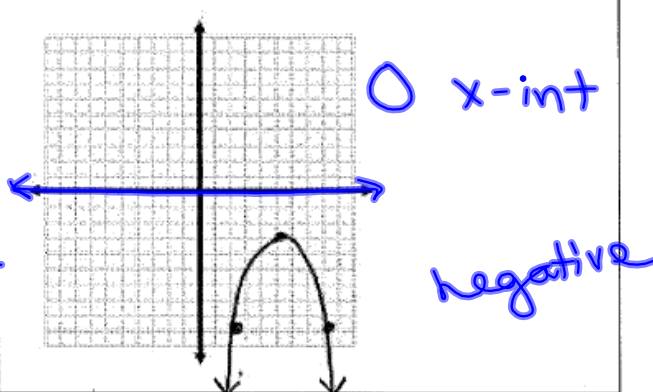
Find the discriminant for the equation below. Then, state how many and what type of solutions the equation will have.

$$\begin{aligned} 2x^2 &= 6x - 8 \\ -2x^2 - 2x^2 & \\ -28 & \\ 0 &= -2x^2 + 6x - 8 \\ 2 \text{ complex} \end{aligned}$$

Will the graph pictured have a positive, negative, or zero discriminant? Explain your answer.



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An equation has one real solution. Will the discriminant of the equation be positive, negative, or zero? Explain your answer.

Zero
1 real

An equation has solutions at 3 and 7. Will the discriminant of the equation be positive, negative, or zero? Explain your answer.

positive
3 and 7 are
real

5.3B Number and Type of Solutions: Part II

1. $y = x^2 - 2x - 8$

a) What is the discriminant?

b) Number of solutions?

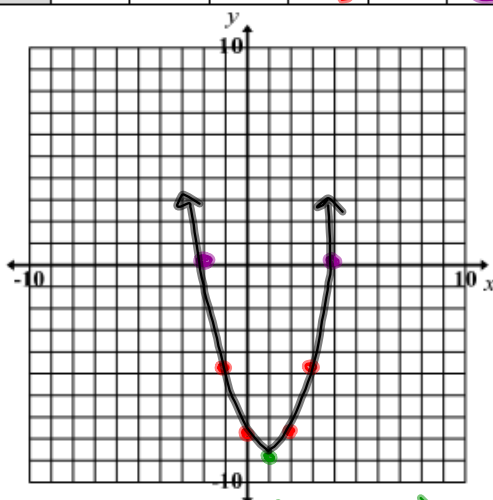
c) Type of solutions?

d) What are the zeros (roots)? $x = -2$
 $x = 4$
 *Factor or use the graph

$(x - 4)(x + 2)$ vertex

e) Graph the equation.

-2	-1	0	1	2	3	4
0	-5	-8	-9	-8	-5	0



f) What is the vertex? $(1, -9)$

g) Is the vertex a minimum or maximum?

min

h) What is the y-intercept?

$(0, -8)$

i) What is the domain?

\mathbb{R}

j) What is the range?

$y \geq -9$

$-9 \leq y < \infty$

2. $y = 9 - x^2$

a) What is the discriminant?

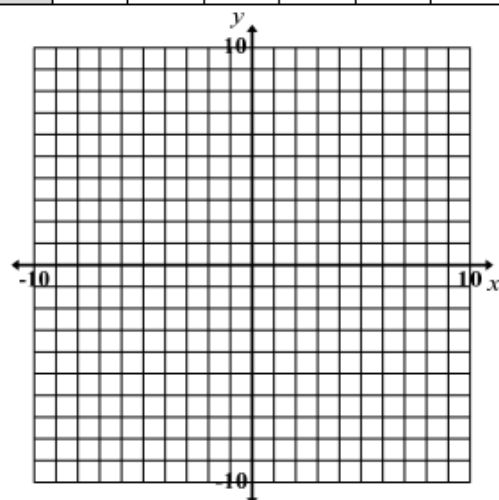
b) Number of solutions?

c) Type of solutions?

d) What are the zeros (roots)?
 *Factor or use the graph

e) Graph the equation.

x						
y						



f) What is the vertex?

g) Is the vertex a minimum or maximum?

h) What is the y-intercept?

i) What is the domain?

j) What is the range?

Simplify the following square roots.

1. $\frac{12 \pm \sqrt{72}}{18}$

DISC = 72
2 Real
(Irrational)

$$\frac{12 \pm \sqrt{72}}{18}$$

$$\frac{12 \pm 6\sqrt{2}}{18}$$

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

$$x = \frac{2 + \sqrt{2}}{3} \quad x = \frac{2 - \sqrt{2}}{3}$$

2. $\frac{7 \pm \sqrt{361}}{5}$ $\rightarrow \sqrt{361} = 19$

DISC = 361
2 Real
(Rational)

$$\frac{7 \pm 19}{5}$$

$$\frac{7 + 19}{5} \quad \frac{7 - 19}{5}$$

$$x = \frac{26}{5} \quad x = -\frac{12}{5}$$

3. $\frac{8 \pm \sqrt{64}}{4}$

DISC = 64
2 Real
(Rational)

$$\frac{8 \pm 8}{4}$$

$$\frac{2 \pm 2}{1}$$

$$\frac{2 + 2}{1} = 4 \quad \frac{2 - 2}{1} = 0$$

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

4. $\frac{6 \pm \sqrt{-36}}{10}$ $\rightarrow \sqrt{-36} = 6i$

DISC = -36
2 complex

$$\frac{6 \pm 6i}{10}$$

$$\frac{3 \pm 3i}{5}$$

$$x = \frac{3 + 3i}{5} \quad x = \frac{3 - 3i}{5}$$

5. $\frac{15 \pm \sqrt{-75}}{30}$

DISC = -75
2 complex

$$\frac{15 \pm 5i\sqrt{3}}{30}$$

$$\frac{15 \pm 5i\sqrt{3}}{30}$$

$$\frac{3 \pm i\sqrt{3}}{6}$$

$$x = \frac{3 + i\sqrt{3}}{6} \quad x = \frac{3 - i\sqrt{3}}{6}$$

6. $\frac{3 \pm \sqrt{-49}}{12}$ $\rightarrow \sqrt{-49} = 7i$

DISC = -49
2 complex

$$\frac{3 \pm 7i}{12}$$

$$x = \frac{3 + 7i}{12} \quad x = \frac{3 - 7i}{12}$$