GSE Algebra 1 **Unit 8 Review** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_

**Factor** the following.

1. $x^{2}-9x+8$ 2) $ 7x^{2}-31x-20$ 3) $x^{2}-7x-18$
2. $7k^{2}-49k$ 5) $16x^{2}-18x+4$ 6) $10x^{2}-810$

**Find** the **zeros**/**roots** by factoring.

1. $4x^{2}+16x+12=0$ 8) $3x^{2}+14x-5=0$ 9) $4x^{2}-49=0$

**Complete** the **square** to find the **solutions**.

1. $x^{2}-8x+12=0$ 11) $2x^{2}+8x-3=0$ 12) $x^{2}+3x=40$

Complete the square to put the following into vertex form. Tell what the vertex is and if the function is a min or a max.

1. $y=-x^{2}+6x-10$ 14) $y=4x^{2}+8x-1$ 15) $y=x^{2}-2x+3$

Find the **roots** by using the **quadratic** **formula**.

1. $x^{2}-9x+20=0$ 17) $6x^{2}-1=10x$ 18) $3x^{2}+4x=-7$

Find the **discriminant** for the following. Tell what the **number** and **kind** of **solutions** each would have and **sketch** a picture of it.

1. $x^{2}+2x+1=0$ 20) $3x^{2}-9x+27=0$ 21) $-2x^{2}+9=0$
2. The product of 2 consecutive positive even integers is 224. Find the two numbers.
3. The square of a number is equal to 7 times the number. Find the two numbers.
4. The length of a photograph is 1 cm less than twice its width. The area is 45 cm2. Find the dimensions of the photo.
5. A rocket carrying fireworks is launched from a hill 100 feet above the lake. The rocket will fall into the lake after exploding at its max height. The rocket’s height above the surface of the lake is given by the function

$h\left(t\right)=-16t^{2}+64t+100$.

1. What is the height of the rocket after 1.5 seconds?
2. When does the rocket reach the maximum height?
3. What is the maximum height reached by the rocket?
4. After how many seconds after it is launched will the rocket hit the lake?
5. Name the three steps to prove the quadratic formula
6. 2) 3)
7. Here is the proof for the quadratic formula. Fill in the blanks with the appropriate information.

$$ax^{2}+bx+c=0$$

$$ax^{2}+bx=-c$$

$$a(x^{2}+\frac{b}{a}x+\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_)=-c+a\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$

$$a(x+\frac{b}{2a})^{2}=-c+\frac{ab^{2}}{4a^{2}}$$

$$a(x+\frac{b}{2a})^{2}=-c+\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$

$$\frac{a(x+\frac{b}{2a})^{2}}{a}=\frac{\frac{-4ac}{4a}+\frac{b^{2}}{4a}}{a}$$

$$(x+\frac{b}{2a})^{2}=\frac{-4ac+b^{2}}{4a^{2}}$$

$$\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_$$

$$x+\frac{b}{2a}=\frac{\pm \sqrt{b^{2}-4ac}}{2a}$$

$$x=\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\pm \frac{\sqrt{b^{2}-4ac}}{2a}$$

$$x=\frac{-b\pm \sqrt{b^{2}-4ac}}{2a}$$