Accelerated Geometry CC
4.1-4.3 Quiz Review

Name: KEY
Date: _____ Period: _____

Find the zeros of each function by factoring:

1. $f(x) = x^2 - 7x$

$0 = x(x-7)$

$x = 0$ or $x - 7 = 0$, $x = 7$

2. $f(x) = x^2 - 9x + 20$

$0 = (x-5)(x-4)$

$x - 5 = 0$, $x = 5$ or $x - 4 = 0$, $x = 4$

3. $f(x) = 3x^2 + 13x + 4$

$0 = 3x^2 + 1x + 12x + 4$

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

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

$3x + 1 = 0$, $3x = -1$, $x = -1/3$ or $x + 4 = 0$, $x = -4$

4. $f(x) = 9x^2 - 30x + 25$

$0 = (3x-5)^2$

$3x - 5 = 0$

$3x = 5$

$x = 5/3$

Find the roots of each equation using factoring:

5. $x^2 - 10x + 25 = 0$

$(x-5)^2 = 0$

$x - 5 = 0$

$x = 5$

6. $7x = 15 - 2x^2$

$2x^2 + 7x - 15 = 0$

$2x^2 - 3x + 10x - 15 = 0$

$x(2x-3) + 5(2x-3) = 0$

$(2x-3)(x+5) = 0$

$2x - 3 = 0$, $2x = 3$, $x = 3/2$ or $x + 5 = 0$, $x = -5$

7. **Write a quadratic function in standard form with zeros 6 and -1.**

$(x-6)(x+1) \rightarrow f(x) = x^2 - 5x - 6$

8. **Complete the square for the expression $x^2 - 15x + \frac{225}{4}$. Write the resulting expression as a binomial squared.**

$(x - \frac{15}{2})^2$

Solve the equation by completing the square:

9. $x^2 - 16x + 64 = 20$

$x^2 - 16x + 64 = -44 + 64$

$(x-8)^2 = 20$

$x - 8 = \pm 2\sqrt{5}$

$x = 8 \pm 2\sqrt{5}$

10. $x^2 - 27 = 4x$

$x^2 - 4x + 4 = 27 + 4$

$(x-2)^2 = 31$

$x - 2 = \pm\sqrt{31}$

$x = 2 \pm \sqrt{31}$

11. $3x^2 + 6x - 1 = 0$

$3x^2 + 6x = 1$

$3(x^2 + 2x + 1) = 1 + 3(1)$

$3(x+1)^2 = 4$

$(x+1)^2 = 4/3$

$x + 1 = \pm \frac{2\sqrt{3}}{3}$

$x = -1 \pm \frac{2\sqrt{3}}{3}$

Write each function in vertex form and identify its vertex:

12. $f(x) = x^2 + 6x - 7$

$f(x) + 7 + 9 = x^2 + 6x + 9$

$f(x) + 16 = (x+3)^2$

$f(x) = (x+3)^2 - 16$

$V(-3, -16)$

13. $f(x) = 2x^2 - 12x - 27$

$f(x) + 27 + 2(9) = 2(x^2 - 6x + 9)$

$f(x) + 45 = 2(x-3)^2$

$f(x) = 2(x-3)^2 - 45$

$V(3, -45)$

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Find the zeros of each function by using the Quadratic Formula:

14. $f(x) = 3x^2 - 6x - 5$

$a=3 \quad b=-6 \quad c=-5$

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

$$x = \frac{6 \pm \sqrt{96}}{6} = \frac{6 \pm 4\sqrt{6}}{6}$$

$$\boxed{x = 1 \pm \frac{2\sqrt{6}}{3}}$$

15. $g(x) = 2x^2 - 6x + 5$

$a=2 \quad b=-6 \quad c=5$

$$x = \frac{-(-6) \pm \sqrt{36-4(2)(5)}}{2(2)}$$

$$x = \frac{6 \pm \sqrt{-4}}{4} = \frac{6 \pm 2i}{4}$$

$$\boxed{x = \frac{3}{2} \pm \frac{1}{2}i}$$

Find the type and number of solutions for each equation:

b^2-4ac

16. $x^2 - 14x = -50$

$x^2-14x+50=0$

$196-4(1)(50) = -4 < 0$

2 Imaginary

17. $-14x = -x^2 - 48$

$x^2-14x+48=0$

$196-4(1)(48) = 4 > 0$

2 Real

18. **A pebble is tossed from the top of a cliff. The pebble's height in feet is given by $y(t) = -16t^2 + 6t + 200$, where t is the time in seconds. Its horizontal distance in feet from the base of the cliff is given by $d(t) = 5t$. How far will the pebble be from the base of the cliff when it hits the ground?**

Need t.

$h=0$

$0 = -16t^2+6t+200$

$$t = \frac{-6 \pm \sqrt{36-4(-16)(200)}}{2(-16)}$$

$$t = \frac{-6 \pm \sqrt{12836}}{-32} = -3.4 \text{ or } \boxed{3.7}$$

-3.4: can't have a negative time!

$d = 5t$

$d = 5(3.7)$

$\boxed{d = 18.5 \text{ feet}}$