

Name: Key Date: _____ Block: _____

**Algebra 2
Final Exam Review
Day 2 – Quadratics, Roots & Rational Expressions**

Identify the form of the quadratic equation and determine if the graph opens up or down. Then find the vertex, axis of symmetry, roots, complete the table and graph the function.

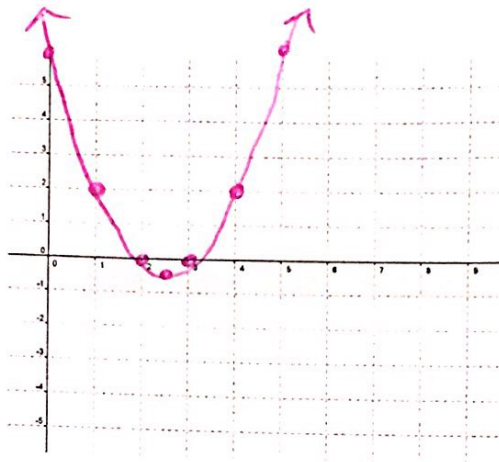
1.) $y = x^2 - 5x + 6$

AOS: $\frac{-(-5)}{2(1)} = 5/2$

Form: Standard \uparrow or \downarrow

Vertex \rightarrow

x	y
1	2
2	0
2.5	-0.25
3	0
4	2



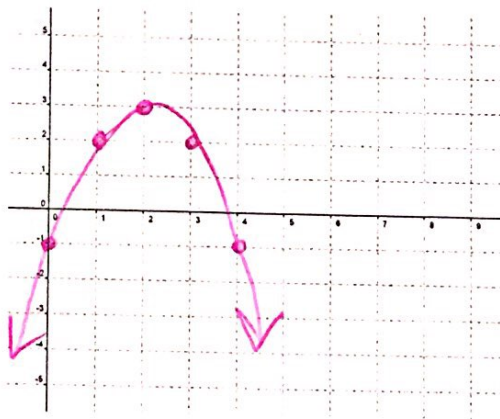
2.) $y = -(x-2)^2 + 3$

AOS = $x = 2$

Form: vertex form \uparrow or \downarrow

Vertex \rightarrow

x	y
0	-1
1	2
2	3
3	2
4	-1



Evaluate the expression.

3.) $\sqrt[3]{\frac{125}{27}} = \frac{5}{3}$

4.) $\sqrt[4]{\frac{81}{16}} = \pm \frac{3}{2}$

5.) $243^{3/5} = (\sqrt[5]{243})^3 = 3^3 = 27$

Simplify the expression.

6.) $2x^{-1/4} \cdot x^{9/4}$

$$2x^{8/4} = \boxed{2x^2}$$

7.) $\sqrt[3]{64x^3y^6z^{12}}$

$$\boxed{4xyz^4}$$

8.) $16^{1/2} \cdot 16^{1/4}$

$$16^{3/4} = (\sqrt[4]{16})^3 = 2^3 = \boxed{8}$$

9.) $\sqrt[4]{80}$

$$\sqrt[4]{16} \cdot \sqrt[4]{5} = \boxed{2\sqrt[4]{5}}$$

10.) $\sqrt{\frac{3}{5}} \cdot \sqrt{\frac{5}{5}} = \frac{\sqrt{15}}{\sqrt{25}} = \boxed{\frac{\sqrt{15}}{5}}$

11.) $(256x^8y^2)^{1/4} = \sqrt[4]{256x^8y^2} = \boxed{4x^2\sqrt{y}}$

Solve the equation. Check for extraneous solutions.

12.) $x^{1/2} + 3 = 8$

$$\sqrt{x} = 5$$

$$\boxed{x = 25}$$

13.) $5 = \sqrt{7x-3}$

$$5^2 = (\sqrt{7x-3})^2$$

$$25 = 7x-3$$

$$28 = 7x$$

$$\boxed{x = 4}$$

14.) $x-6 = \sqrt{x-6}$

FOIL $\rightarrow (x-6)^2 = (\sqrt{x-6})^2$

$$(x-6)^2 = x-6$$

$$x^2 - 12x + 36 = x - 6$$

$$x^2 - 13x + 42 = 0$$

$$(x-7)(x-6) = 0$$

$$\boxed{x=7} \quad \boxed{x=6}$$

15.) $(x+9)^{5/2} - 1 = 31$

$$(x+9)^{5/2} = 32$$

$$(\sqrt{x+9})^5 = 32$$

$$\sqrt{x+9} = \sqrt[5]{32} = 2$$

$$\sqrt{x+9} = 2$$

$$(\sqrt{x+9})^2 = (2)^2$$

$$x+9 = 4$$

$$\boxed{x = -5}$$

State the domain.

16.) $h(x) = \frac{2}{3x-1}$

$$D: x \neq 1/3$$

17.) $h(x) = \frac{7}{x-3} + 4$

$$D: x \neq 3$$

Find the inverse of the equation.

18.) $y = 2x - 3$
 $x = 2y - 3$
 $x + 3 = 2y$
 $y = \frac{x+3}{2}$

19.) $y = \sqrt{x-3}$
 $x = y^2 - 3$
 $x^2 = y - 3$
 $y = x^2 + 3$

Simplify.

20.) $\frac{x^2 + x}{x+1} = \frac{x(x+1)}{(x+1)} = x$ D: $x \neq -1$

Multiply/Divide.

21.) $\frac{9x}{8x+32} \cdot \frac{2x+8}{3x} = \frac{9x}{48(x+3)} \cdot \frac{2(x+3)}{3x} = \frac{3}{4}$

22.) $\frac{x+5}{x} \div \frac{x+5}{2x} = \frac{x+5}{x} \cdot \frac{2x}{x+5} = 2$

23.) $\frac{x^2 - 5x + 4}{x^2} \div \frac{x-4}{x} = \frac{(x-1)(x-4)}{x \cdot x} \cdot \frac{x}{(x-4)} = \frac{x-1}{x}$

24.) $\frac{x^2 + 4x + 4}{x+3} \div x+2 = \frac{(x+2)(x+2)}{(x+3)} \cdot \frac{1}{(x+2)} = \frac{x+2}{x+3}$

Add/Subtract.

25.) $\frac{x+4}{6x} + \frac{4-x}{6x} = \frac{x+4+4-x}{6x} = \frac{8}{6x} = \frac{4}{3x}$

26.) $\frac{1}{x+2} - \frac{2x}{x+5}$

LCD: $(x+2)(x+5)$

$\frac{1(x+5) - 2x(x+2)}{(x+2)(x+5)} = \frac{x+5 - 2x^2 - 4x}{(x+2)(x+5)}$

$\frac{-2x^2 - 3x + 5}{(x+2)(x+5)}$

27.) $\frac{2}{x-3} + \frac{3}{x+1}$

LCD: $(x-3)(x+1)$

$\frac{2(x+1) + 3(x-3)}{(x-3)(x+1)} = \frac{2x+2+3x-9}{(x-3)(x+1)} = \frac{5x-7}{(x-3)(x+1)}$

Solve.

28.) $\frac{x}{2} + \frac{5}{6} = \frac{x}{3}$

LCD = 6

$6(\frac{x}{2}) + 6(\frac{5}{6}) = 6(\frac{x}{3})$

$3x + 5 = 2x$
 $5 = -x$
 $x = -5$

29.) $\frac{1}{x} + \frac{5}{4x} = \frac{3}{2}$

LCD = 4x

$4x(\frac{1}{x}) + 4x(\frac{5}{4x}) = 4x(\frac{3}{2})$

$4 + 5 = 6x$

$9 = 6x$

$9/6 = x$
 $x = 3/2$