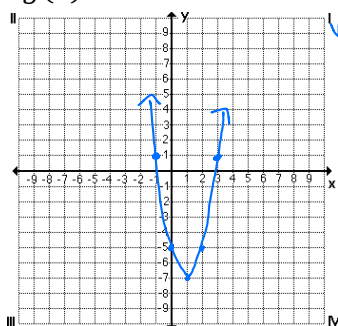


Algebra 2 Unit 3 Review

SHOW ALL WORK on the worksheet

Graph each function. Identify the vertex, A.O.S., domain, range, intercepts, max/min value, and end behavior.

1. $g(x) = 2x^2 - 4x - 5$



$$V: x = \frac{-b}{2a} = 1$$

x	1	0	-1
y	-7	-5	1

Vertex: $(1, -7)$

A.O.S.: $x = 1$

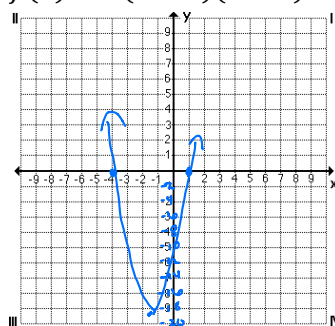
x-intercept: $0 = 2x^2 - 4x - 5$
 $x = \frac{4 \pm \sqrt{16 + 40}}{4} = \frac{4 \pm 2\sqrt{14}}{4} = \frac{2 \pm \sqrt{14}}{2}$

y-intercept: -5

Max/Min Value: $\text{Min} = -7$

End Behavior: $x \rightarrow \infty, g(x) \rightarrow \infty$
 $x \rightarrow -\infty, g(x) \rightarrow \infty$

2. $f(x) = 3(x - 1)(x + 4)$



$$V: x = \frac{-b}{2a} = -\frac{3}{2}$$

$$y = 3(-\frac{3}{2} - 1)(-\frac{3}{2} + 4)$$

$$= 3(-\frac{5}{2})(\frac{5}{2})$$

$$= -\frac{75}{4}$$

$$= -18.75$$

Vertex: $(-\frac{3}{2}, -\frac{75}{4})$

A.O.S.: $x = -\frac{3}{2}$

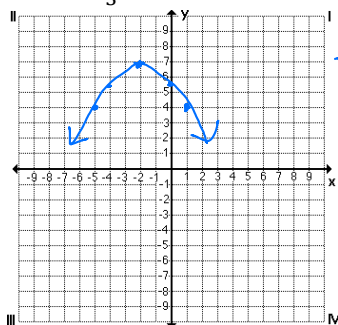
x-intercept: $0 = 3(x - 1)(x + 4)$
 $x = 1, -4$

y-intercept: $y = 3(0 - 1)(0 + 4)$
 $= -12$

Max/Min Value: $\text{Min} = -\frac{75}{4}$

End Behavior: $x \rightarrow \infty, f(x) \rightarrow \infty$
 $x \rightarrow -\infty, f(x) \rightarrow \infty$

3. $y = -\frac{1}{3}(x + 2)^2 + 7$



x	-2	0	1
y	7	17/3	4

Vertex: $(-2, 7)$

A.O.S.: $x = -2$

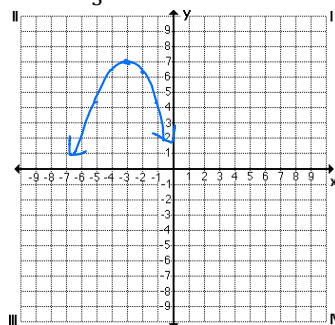
x-intercept: $0 = -\frac{1}{3}(x + 2)^2 + 7$
 $-2 \pm \sqrt{21} = x$

y-intercept: $\frac{17}{3}$

Max/Min Value: $\text{Max} = 7$

End Behavior: $x \rightarrow \infty, y \rightarrow -\infty$
 $x \rightarrow -\infty, y \rightarrow -\infty$

4. $y = -\frac{2}{3}x^2 - 4x + 1$



$$V: x = \frac{-b}{2a} = -3$$

x	-3	-2	-1
y	7	6.5	4.3

Vertex: $(-3, 7)$

A.O.S.: $x = -3$

x-intercept: $0 = -\frac{2}{3}x^2 - 4x + 1$
 $x = \frac{4 \pm \sqrt{16 + 8/3}}{-4/3} \approx -6.24, .24$

y-intercept: 1

Max/Min Value: $\text{Max} = 7$

End Behavior: $x \rightarrow \infty, y \rightarrow -\infty$
 $x \rightarrow -\infty, y \rightarrow -\infty$

5. The path of a placekicked football can be modeled by the function $y = -0.026x(x - 46)$ where x is the horizontal distance (in yards) and y is the height (in yards). What is the football's maximum height?

at vertex

$$x\text{-int: } 0, 46$$

$$\text{Vertex: } x = \frac{0+46}{2} = 23$$

$$y = -0.026(23)(-23) \approx 13.754$$

Max Height is 13.754 yards

Algebra 2 Unit 3 Review

Solve each equation

$$6. -3y + 28 = y^2$$

$$0 = y^2 + 3y - 28$$

$$0 = (y+7)(y-4)$$

$$y = -7, 4$$

$$7. 6x^2 = 8x$$

$$6x^2 - 8x = 0$$

$$2x(3x-4) = 0$$

$$x = 0, \frac{4}{3}$$

$$8. x^2 = 6x - 4$$

$$x^2 - 6x + 4 = 0$$

$$x = \frac{6 \pm \sqrt{36 - 16}}{2}$$

$$= \frac{6 \pm 2\sqrt{5}}{2}$$

$$= 3 \pm \sqrt{5}$$

$$9. 7x - 3x^2 = 85 + 2x^2 + 2x$$

$$0 = 5x^2 - 5x + 85$$

$$0 = 5(x^2 - x + 17)$$

$$x = \frac{1 \pm \sqrt{1 - 68}}{2}$$

$$= \frac{1 \pm \sqrt{-67}}{2}$$

$$= \frac{1 \pm i\sqrt{67}}{2}$$

$$10. \frac{t^2}{20} + 8 = 15$$

$$\frac{t^2}{20} = 7$$

$$t^2 = 140$$

$$t = \pm \sqrt{140}$$

$$t = \pm 2\sqrt{35}$$

$$11. 3(x+2)^2 + 10 = 3$$

$$(x+2)^2 = -\frac{7}{3}$$

$$x+2 = \pm i\sqrt{\frac{7}{3}}$$

$$x = -2 \pm i\frac{\sqrt{21}}{3}$$

$$12. 4x^2 + 12x + 56 = 0$$

$$4(x^2 + 3x + 14) = 0$$

$$x = \frac{-3 \pm \sqrt{9 - 56}}{2}$$

$$= \frac{-3 \pm \sqrt{-47}}{2}$$

$$= \frac{-3 \pm i\sqrt{47}}{2}$$

$$13. 4x^2 + 11x + 3 = -3$$

$$4x^2 + 11x + 6 = 0$$

$$(x+2)(4x+3) = 0$$

$$x = -2, -\frac{3}{4}$$

$$14. \text{Find the x-intercepts of } f(x) = 3x^2 - 8x + 5$$

$$0 = 3x^2 - 8x + 5$$

$$0 = (3x-5)(x-1)$$

$$x = 1, \frac{5}{3}$$

Write the expression as a complex number in standard form

$$15. -8 - (3 + 2i) + (7 + 5i)$$

$$= -8 - 3 - 2i + 7 + 5i$$

$$= -4 + 3i$$

$$16. (5 - 7i)(-4 + 3i)$$

$$= -20 + 15i + 28i - 21i^2$$

$$= 1 + 43i$$

$$17. 5i(3 + 2i)(8 + 3i)$$

$$= (15i + 10i^2)(8 + 3i)$$

$$= 120i + 45i^2 - 80 - 30i$$

$$= -125 + 90i$$

$$18. \frac{(5-3i) + (2+8i)}{(7+2i) - (11+4i)}$$

$$= \frac{7+5i}{-4-2i} \cdot \frac{-4+2i}{-4+2i}$$

$$= \frac{-28+14i-20i+10i^2}{16-4i^2} = \frac{-38-6i}{20}$$

$$= \frac{-19-3i}{10}$$