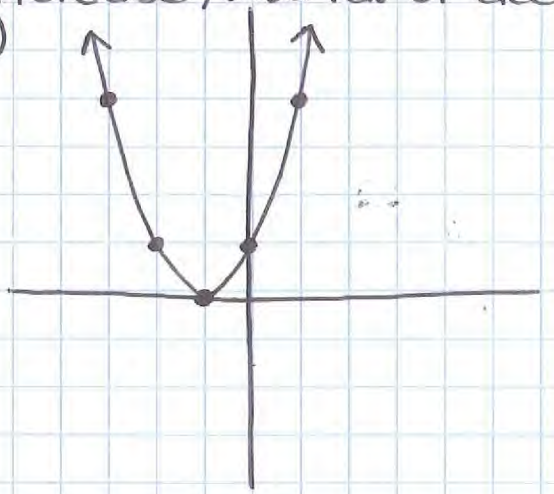
Unit 5 Practice *2

Find the vertex, AOS, extrema and y-int.

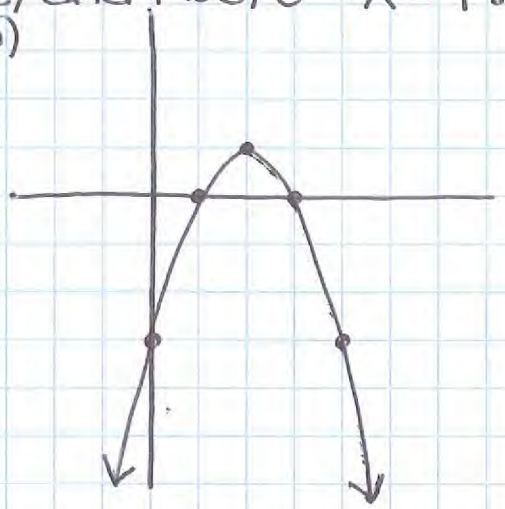
1) $y=-3(x+4)^2-8$
2) $y=-x^2+6x-4$
3) $y=\frac{1}{2}x^2-5x+3$
4) $y=(x-9)^2+6$
5) $y=2x^2-8x-3$
6) $y=2(x-1)^2$
7) $y=-x^2+12$
8) $y=3x^2+12x+5$

Find the vertex, AOS, extrema, y-int, x-int, zeros, End Behavior (as $x\to-\infty$ and as $x\to\infty$), interval of increase, interval of decrease, and ROC, $0\le x\le 1$.

9)



10)



Describe how the graph of the parent function $y=x^2$ was transformed to create the given function.

11) $y=-x^2+5$
12) $y=\frac{1}{3}(x-2)^2+8$
13) $y=(\frac{1}{2}x)^2-4$
14) $y=(5x-9)^2$
15) $y=3(-x+4)^2$
16) $y=\frac{1}{6}x^2-2$

[Unit 4 Review]

17) Add: $(2x^2+5x-7)+(-x^2-2x+4)$
18) Subtract: $(-4x^2-2x+3)-(3x^2+2x+8)$
19) Multiply: $(x^2+8x-2)(2x^2-3x+4)$
20) Simplify: $\sqrt{40}$
21) Simplify: $\sqrt{32}-\sqrt{8}$
22) Simplify: $\sqrt{8x^2y^4}$
23) Simplify: $\sqrt{16x^3y^5z^7}$

1) $y = -3(x+4)^2 - 8$

V: $(-4, -8)$

AOS: $x = -4$

ext: max at -8

y-int: $(0, -56)$

$= -3(0+4)^2 - 8$

$= -3(4)^2 - 8$

$= -3(16) - 8$

$= -48 - 8$

$= -56$

2) $y = -x^2 + 6x - 4$

$x = \frac{-b}{2a} = \frac{-(6)}{2(-1)} = \frac{-6}{-2} = 3$

$y = -(3)^2 + 6(3) - 4$

$= -9 + 18 - 4$

$= 9 - 4$

$= 5$

V: $(3, 5)$

AOS: $x = 3$

ext: max at 5

y-int: $(0, -4)$

3) $y = \frac{1}{2}x^2 - 5x + 3$

$x = \frac{-b}{2a} = \frac{-(-5)}{2(1/2)} = \frac{5}{1} = 5$

$y = \frac{1}{2}(5)^2 - 5(5) + 3$

$= 12.5 - 25 + 3$

$= -12.5 + 3$

$= -9.5$

V: $(5, -9.5)$

AOS: $x = 5$

ext: min at -9.5

y-int: $(0, 3)$

4) $y = (x-9)^2 + 6$

V: $(9, 6)$

AOS: $x = 9$

ext: min at 6

y-int: $(0, 87)$

$= (0-9)^2 + 6$

$= (-9)^2 + 6$

$= 81 + 6$

$= 87$

5) $y = 2x^2 - 8x - 3$

$x = \frac{-b}{2a} = \frac{-(-8)}{2(2)} = \frac{8}{4} = 2$

$y = 2(2)^2 - 8(2) - 3$

$= 8 - 16 - 3$

$= -8 - 3$

$= -11$

V: $(2, -11)$

AOS: $x = 2$

ext: min at -11

y-int: $(0, -3)$

6) $y = 2(x-1)^2$

V: $(1, 0)$

AOS: $x = 1$

ext: min at 0

y-int: $(0, 2)$

$= 2(0-1)^2$

$= 2(-1)^2$

$= 2(1)$

$= 2$

7) $y = -x^2 + 12$

V: (0, 12)

AOS: $x = 0$

ext: max at 12

y-int: (0, 12)

8) $y = 3x^2 + 12x + 5$

$x = \frac{-b}{2a} = \frac{-(12)}{2(3)} = \frac{-12}{6} = -2$

$y = 3(-2)^2 + 12(-2) + 5$

$= 12 - 24 + 5$

$= -12 + 5$

$= -7$

V: (−2, −7)

AOS: $x = -2$

ext: min at −7

y-int: (0, 5)

	#9	#10
vertex	(−1, 0)	(2, 1)
AOS	$x = -1$	$x = 2$
extrema	min at 0	max at 1
y-int	(0, 1)	(0, −3)
x-int	(−1, 0)	(1, 0) and (3, 0)
zeros	−1	1 and 3
EB: as $x \to -\infty$, $y \to$	∞	$-\infty$
as $x \to \infty$, $y \to$	∞	$-\infty$
Int of Inc	$x \geq -1$	$x < 2$
Int of Dec	$x < -1$	$x \geq 2$
ROC, $0 \leq x \leq 1$	3	3

11) $y = -x^2 + 5$

reflect over x-axis

up 5

12) $y = \frac{1}{3}(x-2)^2 + 8$

v shrink by $\frac{1}{3}$

right 2, up 8

13) $y = (\frac{1}{2}x)^2 - 4$

h stretch by 2

down 4

14) $y = (5x-9)^2$

h shrink by $\frac{1}{5}$

right 9

15) $y = 3(-x+4)^2$

∨ stretch by 3
reflect over y-axis
left 4

16) $y = \frac{1}{6}x^2 - 2$

∨ shrink by $\frac{1}{6}$
down 2

17) $(2x^2+5x-7)+(-x^2-2x+4)$

$2x^2+5x-7-x^2-2x+4$

$\boxed{x^2+3x-3}$

18) $(-4x^2-2x+3)-(3x^2+2x+8)$

$-4x^2-2x+3-3x^2-2x-8$

$\boxed{-7x^2-4x-5}$

19) $(x^2+8x-2)(2x^2-3x+4)$

	$2x^2$	$-3x$	4
x^2	$2x^4$	$-3x^3$	$4x^2$
$8x$	$16x^3$	$-24x^2$	$32x$
-2	$-4x^2$	$6x$	-8

$\boxed{2x^4+13x^3-24x^2+38x-8}$

20) $\sqrt{40}$

1·40
2·20
4·10
5·8

$\sqrt{4}\cdot\sqrt{10}$

$2\cdot\sqrt{10}$

$\boxed{2\sqrt{10}}$

21) $\sqrt{32}-\sqrt{8}$

1·32
2·16
4·8

1·8
2·4

$\sqrt{2}\cdot\sqrt{16}-\sqrt{2}\cdot\sqrt{4}$

$\sqrt{2}\cdot 4-\sqrt{2}\cdot 2$

$4\sqrt{2}-2\sqrt{2}$

$\boxed{2\sqrt{2}}$

22) $\sqrt{8x^2y^4}$

$\sqrt{8}\cdot\sqrt{x^2}\cdot\sqrt{y^4}$

$\sqrt{2}\cdot\sqrt{4}\cdot x\cdot y^2$

$\sqrt{2}\cdot 2\cdot x\cdot y^2$

$\boxed{2xy^2\sqrt{2}}$

23) $\sqrt{16x^3y^5z^7}$

$\sqrt{16}\cdot\sqrt{x^3}\cdot\sqrt{y^5}\cdot\sqrt{z^7}$

$4\cdot\sqrt{x^2}\cdot\sqrt{x}\cdot\sqrt{y^4}\cdot\sqrt{y}\cdot\sqrt{z^6}\cdot\sqrt{z}$

$4\cdot x\cdot\sqrt{x}\cdot y^2\cdot\sqrt{y}\cdot z^3\cdot\sqrt{z}$

$\boxed{4xy^2z^3\sqrt{xyz}}$