Dynamics of Algebra II (17-18) Name _____

MP1 Benchmark Assessment REVIEW Date _____ Block _____

1) Graph the following. Label <u>at least 5 points</u> on the graph. State domain and range in interval notation.

a) $f(x) = -2(x-1)^2 + 8$

a = -2 h = 1 k = 8

Up/Down down

Wide/Narrow/Normal narrow

Vertex (1, 8)

Domain $\mathbb{R}$ $(-\infty, \infty)$

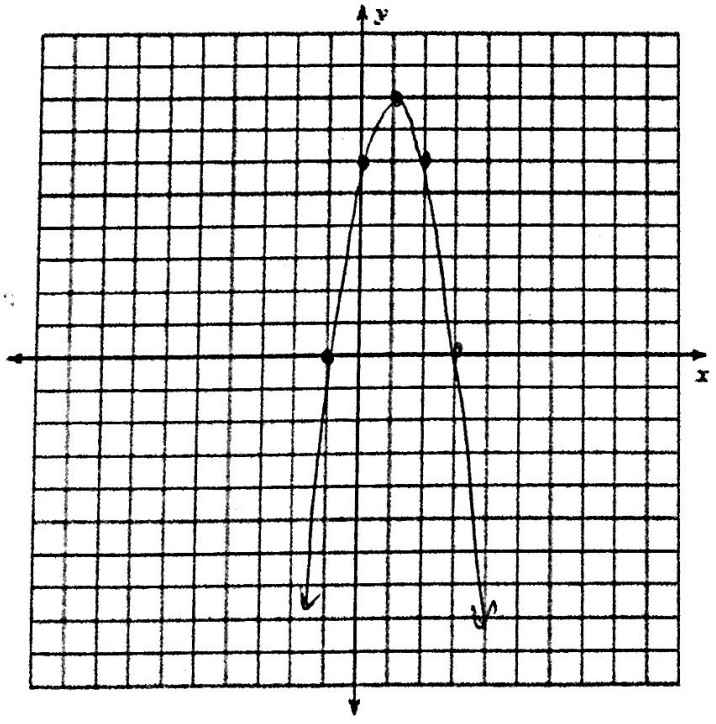
Range $y \leq 8$ $(-\infty, 8]$

a

-1	0
0	6
1	8
2	6
3	0

$-2(1, 3, 5)$

$\frac{-2}{1}$ $\frac{-6}{1}$ $\frac{-10}{1}$



b) $f(x) = -2|x-1| + 8$

a = -2 h = 1 k = 8

Up/Down down

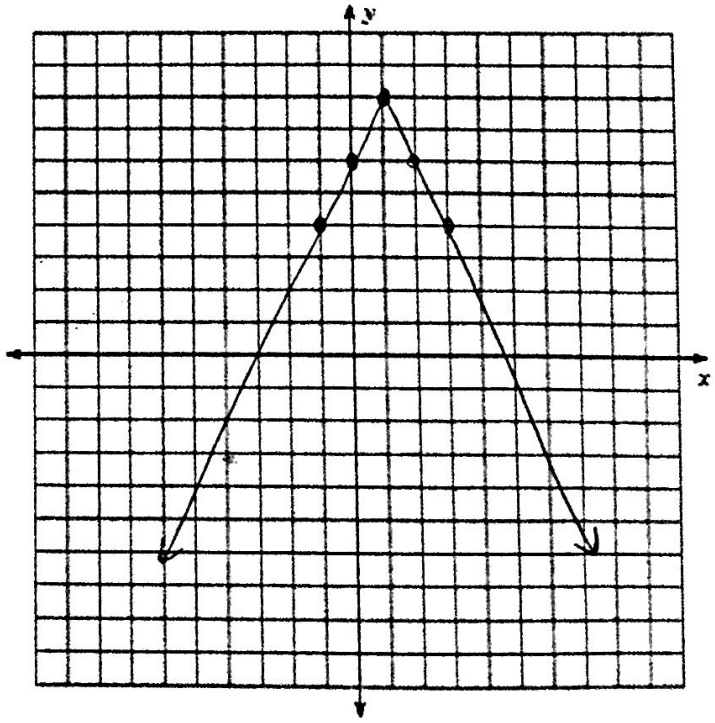
Wide/Narrow/Normal narrow

Vertex (1, 8)

Domain $\mathbb{R}$ $(-\infty, \infty)$

Range $y \leq 8$ $(-\infty, 8]$

-1	4
0	6
1	8
2	6
3	4



2) The New River Gorge Bridge in West Virginia is the world's largest steel single arch bridge. The arch can be modeled by the function $y = -0.000498x^2 + 0.847x$, where x is the horizontal distance in feet and y is the height in feet. Round all parts to the **TENTHS** place if necessary.

$$x = -\frac{b}{2a}$$

a) What is the bridge's maximum height?

$x = \frac{-b}{2a}$ $\quad \frac{-.847}{2(-.000498)}$

$a = -.000498$ $\quad \frac{-.847}{-.000996}$

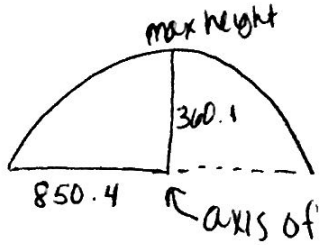
$b = .847$ $\quad = 850.4$

$c = 0$

$y = -.000498(850.4) + .847(850.4)$

$y = 360.1$ ft

max height 360.1 ft



b) How long (total distance) is the bridge?

$850.4 \times 2 = 1700.8$

total distance 1700.8 ft

3) Solve $3x^2 - 6x = -14$ using the quadratic formula. Write your answer in simplest form.

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

$3x^2 - 6x = -14$

$+14 \quad +14$

$3x^2 - 6x + 14 = 0$

$a = 3$

$b = -6$

$c = 14$

$x = \frac{6 \pm \sqrt{(-6)^2 - 4(3)(14)}}{2(3)}$

$x = \frac{6 \pm \sqrt{-132}}{6}$

$x = \frac{6 \pm \sqrt{-1}\sqrt{4}\sqrt{33}}{6}$

$x = \frac{6 \pm 2i\sqrt{33}}{6}$

$x = \frac{3 \pm i\sqrt{33}}{3}$

4) **Simplify each. Write answers in standard form:** $a+bi$

a) $(-3+6i)+(9-11i)$

$6-5i$

b) $(-4+3i)-(-8-21i)$

$-4+3i+8+21i$

$4+24i$

c) $\dfrac{(4-6i)(-2+4i)}{(-2-4i)(-2+4i)} = \dfrac{-8+16i+12i-24i^2}{4-8i+8i-16i^2}$

$= \dfrac{-8+28i-24(-1)}{4-16(-1)}$

$= \dfrac{-8+28i+24}{4+16}$

$= \dfrac{16+28i}{20}$

$= \boxed{\dfrac{4+7i}{5}}$