

ANSWERS

Math Precalc 20 Chapter 7 Review

#1. Evaluate the following:

a) $-2|3-10|$ (2 marks)

$$-2|-7|$$

$$-2(7) = -14$$

b) $-3|1-2| + 2|4-10|$ (2 marks)

$$-3|-1| + 2|-6|$$

$$-3(1) + 2(6)$$

$$-3 + 12$$

$$= 9$$

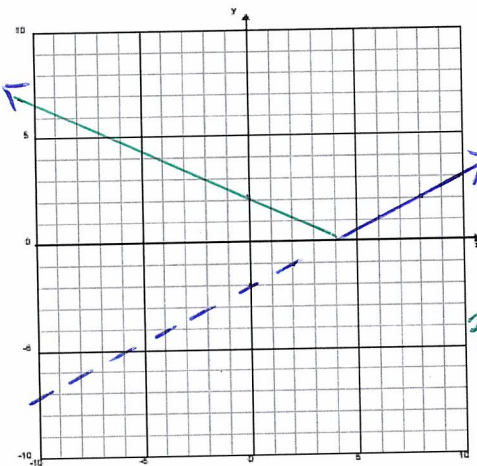
#2. Graph each of the following & write the piecewise function for each. (4 marks = 16 marks)

a) $y = \left| \frac{1}{2}x - 2 \right|$

$$y = mx + b$$

$$m = \frac{1}{2}$$

$$b = -2$$



$$x \text{ int}$$

$$0 = \frac{1}{2}x - 2$$

$$2 = \frac{1}{2}x$$

$$4 = x$$

piecewise

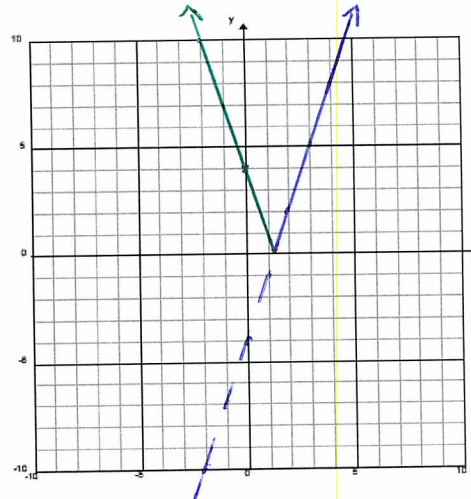
$$\frac{1}{2}x - 2 \text{ when } x \geq 4$$

$$-\left(\frac{1}{2}x - 2\right) \text{ when } x < 4$$

b) $y = |3x - 4|$

$$b = -4$$

$$m = \frac{3}{1}$$



$$0 = 3x - 4$$

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

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

piecewise

$$3x - 4 \text{ when } x \geq \frac{4}{3}$$

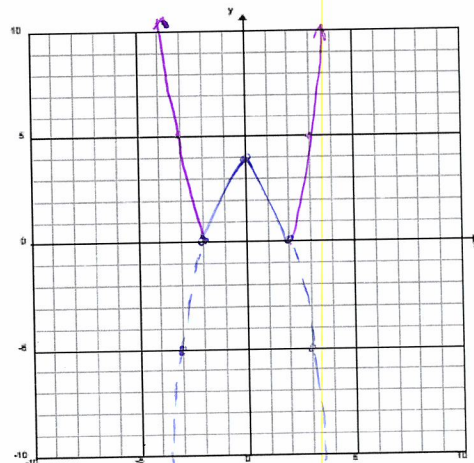
$$-(3x - 4) \text{ when } x < \frac{4}{3}$$

c) $y = |-x^2 + 4|$

$$-(x^2 - 4)$$

$$-(x - 2)(x + 2)$$

$$x = 2 \quad x = -2$$



piecewise

$$(-x^2 + 4) \text{ when } -2 \leq x \leq 2$$

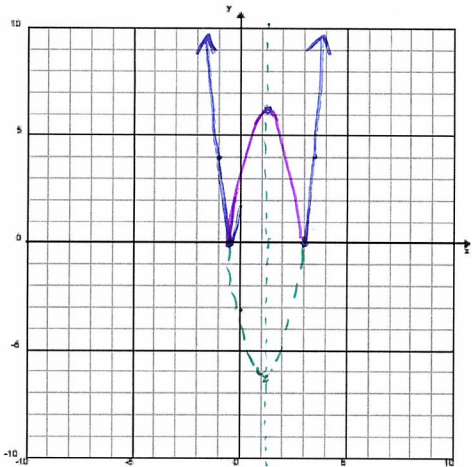
$$-(-x^2 + 4) \text{ when } x < -2$$

$$x > 2$$

$$y = (x-3)(2x+1)$$

$$d) y = |2x^2 - 5x - 3|$$

$$x=3 \quad x = -\frac{1}{2}$$



$$p = \frac{-(-5)}{2(2)} = \frac{5}{4}$$

$$q = -3 - 2\left(\frac{5}{4}\right)^2 = -3 - 2\left(\frac{25}{16}\right) = -3 - \frac{25}{8} = -\frac{24}{8} - \frac{25}{8} = -\frac{49}{8} = -6\frac{1}{8}$$

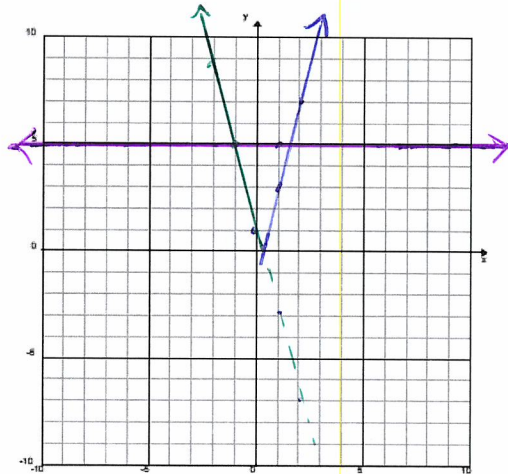
$$\left(\frac{5}{4}, -6\frac{1}{8}\right)$$

piecewise $2x^2 - 5x - 3$ when $x \leq -\frac{1}{2}$
 $x \geq 3$
 $-(2x^2 - 5x - 3)$ when $-\frac{1}{2} < x < 3$

#4. Solve by graphing. (3 marks)

$$5 = |-4x + 1| \quad y = -4x + 1$$

$$y = 5$$



solutions $\{-1, 1.5\}$

#3. Solve each of the following absolute value equations algebraically. Be sure to VERIFY your answers.

#1 $|2x - 3| = 7$

(3 marks)

#2 $2x - 3 = 7$
 $+3 \quad +3$
 $2x = 10$
 $\frac{2x}{2} = \frac{10}{2}$
 $x = 5$

#3 $-(2x - 3) = 7$
 $-2x + 3 = 7$
 $\quad -3 \quad -3$
 $-2x = 4$
 $\frac{-2x}{-2} = \frac{4}{-2}$
 $x = -2$

#4 Verify

$|2(5) - 3| = 7$ $|2(-2) - 3| = 7$
 $|10 - 3| = 7$ $| -4 - 3| = 7$
 $|7| = 7$ $| -7| = 7$
 $7 = 7$

solutions $\{-2, 5\}$

#5. Solve by graphing. Where necessary, you may approximate the solutions. (4 marks)

$$|x^2 + x - 2| = 1 \quad y = 1$$

$$(x+2)(x-1)$$

$$x = -2 \quad x = 1$$

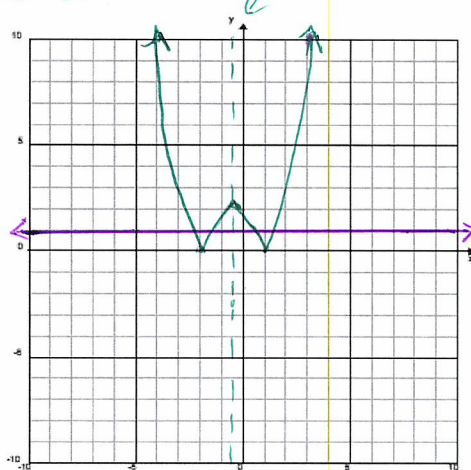
$$\left(\frac{-1}{2}\right)^2 + \left(\frac{-1}{2}\right) - 2$$

$$\frac{1}{4} + \left(\frac{-1}{2}\right) - 2$$

$$\frac{1}{4} - \left(\frac{2}{4}\right) - 2$$

$$-\frac{1}{4} - 2$$

$$-2\frac{1}{4}$$



$$\frac{-(-3) \pm \sqrt{9 - 4(-3)(2)}}{2(-3)}$$

$$\frac{3 \pm \sqrt{33}}{-6}$$

solutions $\{-2.3, -1.6, 0.6, 1.3\}$

#1 b) $|3x^2 - x| = 4x - 2$

(4 marks)

#2 $3x^2 - x = 4x - 2$
 $3x^2 - 5x + 2 = 0$
 $(3x - 2)(x - 1) = 0$
 $3x - 2 = 0 \quad x = 1$
 $x = \frac{2}{3}$

#3 $-(3x^2 - x) = 4x - 2$
 $-3x^2 + x = 4x - 2$
 $-3x^2 - 3x + 2 = 0$

solutions $\left\{\frac{2}{3}, 1\right\}$

~~$x = 1.45$~~
 ~~$x = 0.45$~~