HONORS Algebra II
Summer Preparation Packet 2025-2026

This preparation packet is designed for you to practice the skills you must master prior to entering the Honors Algebra II classroom.

Please follow these directions very carefully.

1. All students must complete the problems in this packet **independently and document their OWN work**.

2. DUE DATE: SEPTEMBER 5th (A day) or SEPTEMBER 8th (B day)

3. There will be an assessment on all material covered in this packet the third day of class.

4. It is recommended that you work on this assignment throughout the summer, periodically reviewing the material. **Doing it all at the start of summer or waiting until the end of summer to begin this packet is strongly discouraged.**

5. You may use websites such as Khan Academy to assist you but understand that copying work from a math app will not help you the day of the assessment or during the year.

6. **Show all work neatly and clearly to receive full credit.** Put answers on the line (if provided) or circle the final answer.

7. You may use a **scientific calculator only** on these problems. **No** graphing calculators.

8. The answers are at the end of the document for you to check your work prior to the due date. Make corrections to your work if necessary. Your answer must be supported by your work.

1. FACTOR each of the following completely. Show all work.

a. $x^2+13x+40$ **b.** $3x^2+17x+10$ **c.** $9x^2-30x+36$

d. $2x^2-6x$ **e.** $49x^2-25$ **f.** x^2-6x+9

g. $-5x^2+35x-60$ **h.** $-2x^2-7x+15$ **i.** x^4-81x^2

2. SOLVE by FACTORING. Leave answers in simplest fraction form - no decimals. Show all work.

a. $2x^2-x=3$ **b.** $6x^2+4x=0$ **c.** $16x^2+40x+25=0$

3. Solve using the QUADRATIC FORMULA. Leave answers in simplest radical form (no rounding and no decimals). Show all work.

a. $12x+9x^2=5$ **b.** $3x^2=2(2x+1)$ **c.** $6x-5=-x^2$

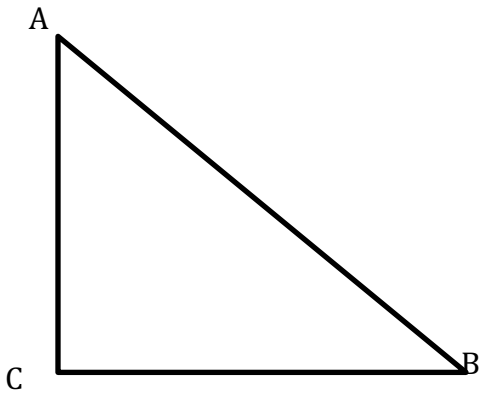
4. Given the diagram below, find the value of *x* if:

$m\measuredangle A=2x^2+31$

$m\measuredangle B=5x+7$

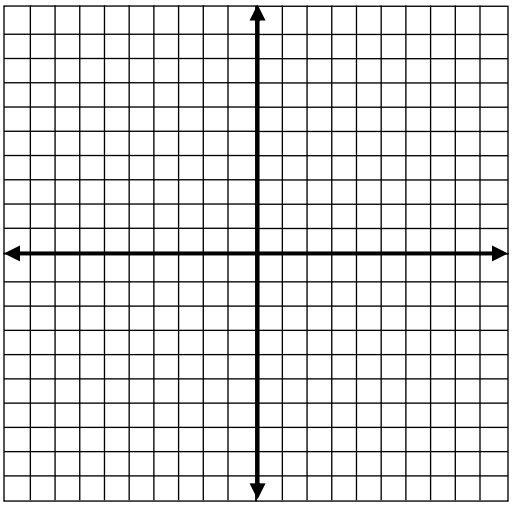
$m\measuredangle C=90°$

Show all work.

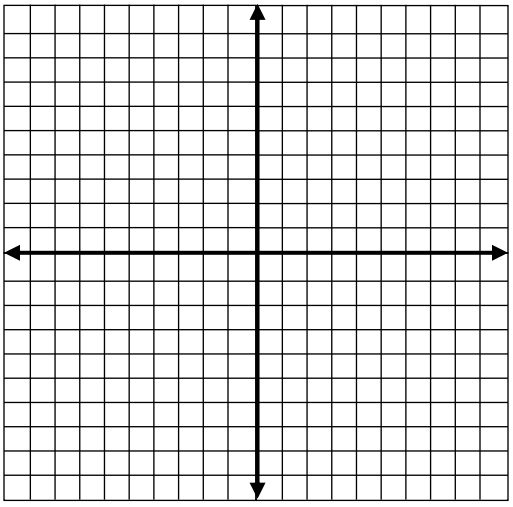


5. Graph each of the quadratic functions given in vertex form with at least 5 points for each. Graphs should fill all available space. Label coordinates or make a table for all points.

a. $f(x)=(x-2)^2+4$

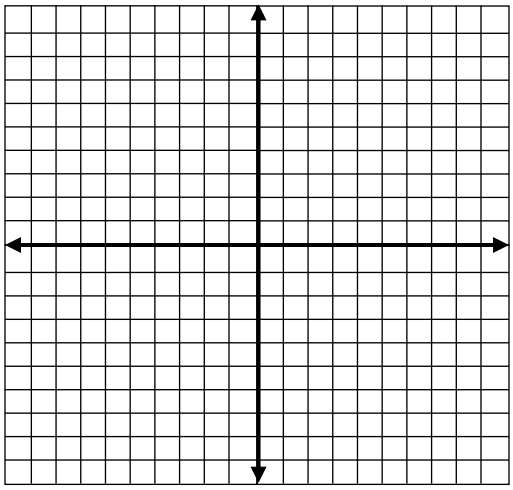


b. $f(x)=-2(x+1)^2+8$



6. Graph each, identifying to which family of functions it belongs, filling all available space. List domain and range in interval notation. Label coordinates or make a table for all points.

a. $y=2|x-3|+5$

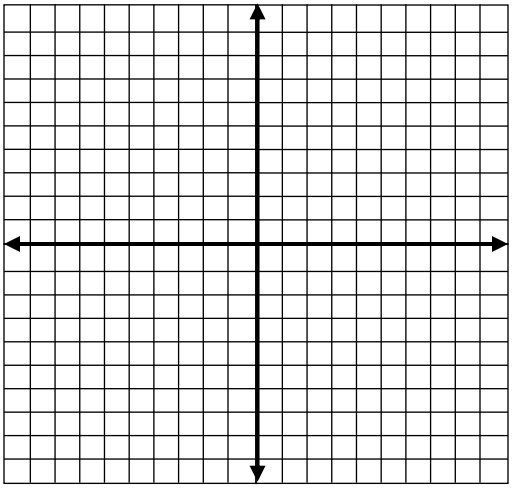


Family:

Domain:

Range:

b. $y=-2x^2+8x-7$



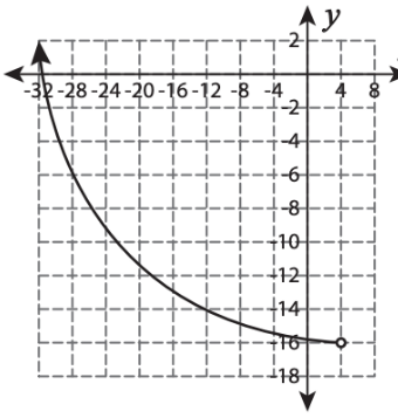
Family:

Domain:

Range:

7. List the domain and range in interval notation for the following graphs.

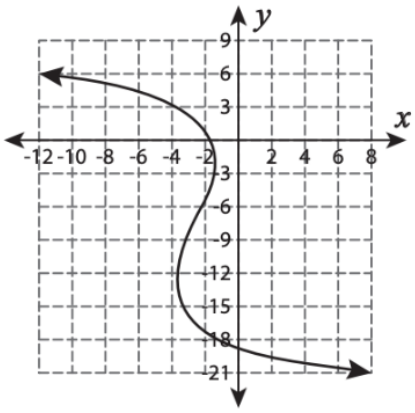
a.



Domain: _____

Range: _____

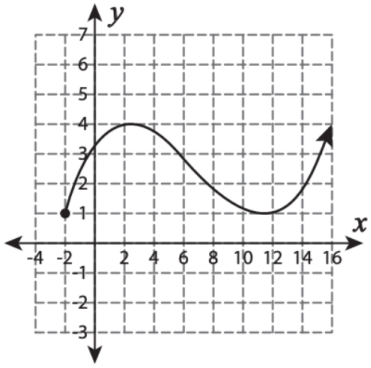
b.



Domain: _____

Range: _____

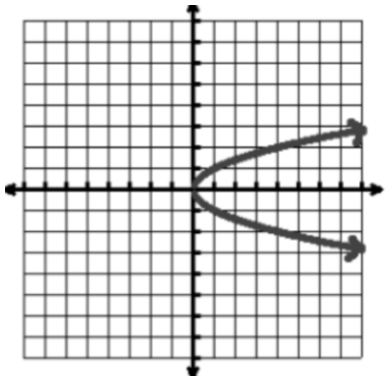
c.



Domain: _____

Range: _____

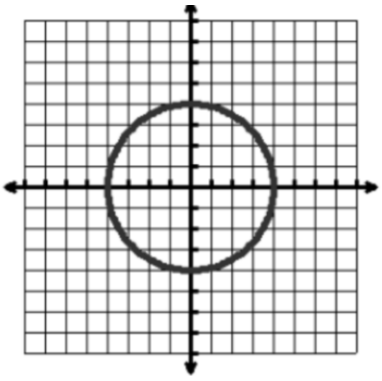
d.



Domain: _____

Range: _____

e.



Domain: _____

Range: _____

8. SIMPLIFY each of the following algebraic expressions. Leave answers in standard form.

a. $\left(2x^3 - \frac{3}{4}x + 12\right) + \left(\frac{5}{8}x - 7\right)$

b. $\left(2x^3 + 5x^2 + 2x + 12\right) - \left(4x^2 - 2x + 12\right)$

c. $x\left(3x^2 + 12\right)$

d. $(2x - 3)(3x + 4)$

e. $(3x - 2)^2$

f. $(2x^2 - 4x + 7)(2x - 3)$

Answers

1a. $(x+8)(x+5)$

1b. $(3x+2)(x+5)$

1c. $3(3x^2-10x+12)$

1d. $2x(x-3)$

1e. $(7x+5)(7x-5)$

1f. $(x-3)^2$

1g. $-5(x-4)(x-3)$

1h. $-(2x-3)(x+5)$

1i. $x^2(x+9)(x-9)$

2a. $x=\frac{3}{2},\ -1$

2b. $x=-\frac{2}{3},\ 0$

2c. $x=-\frac{5}{4}$

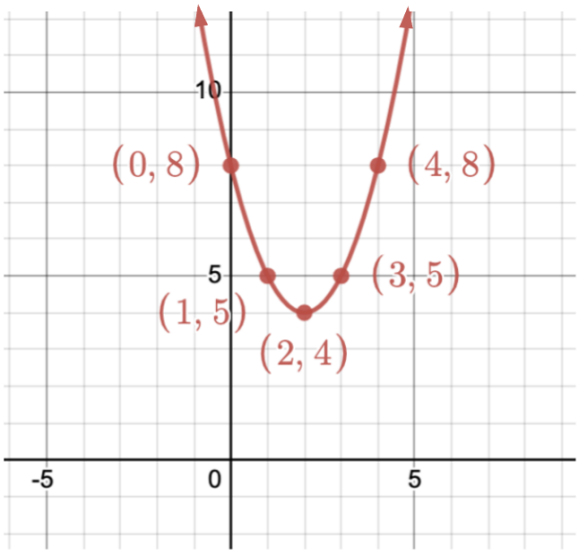
3a. $x=\frac{1}{3},\ -\frac{5}{3}$

3b. $x=\frac{2\pm\sqrt{10}}{3}$

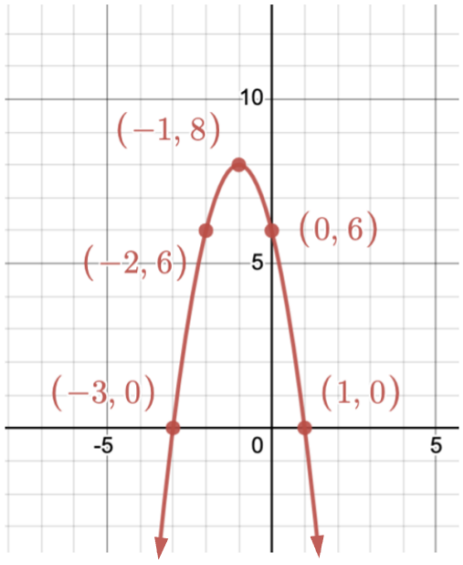
3c. $x=-3\pm\sqrt{14}$

4. $x=4$

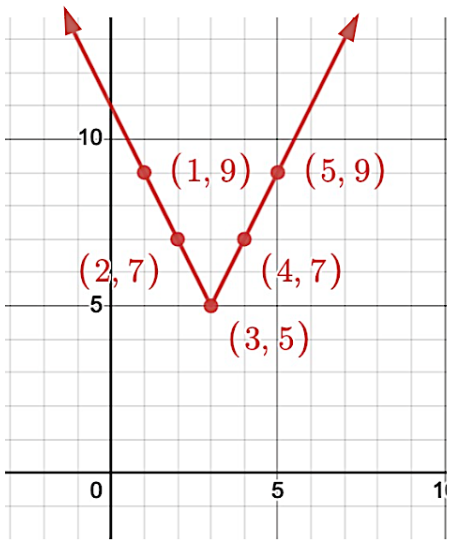
5a.



5b.



6a.

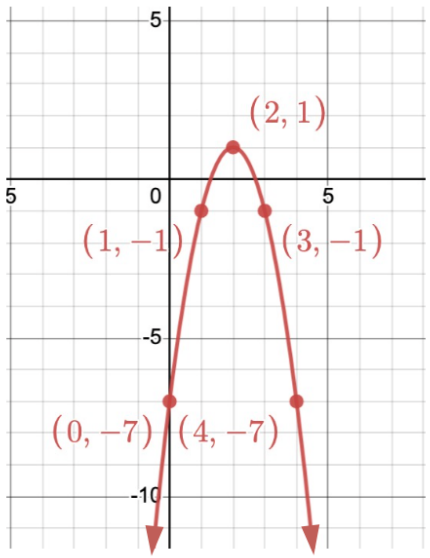


Family: absolute value

Domain: $(-\infty, \infty)$

Range: $[5, \infty)$

6b.



Family: quadratic

Domain: $(-\infty, \infty)$

Range: $(-\infty, 1]$

7a. Domain: $(-\infty, 4)$
Range: $(-16, \infty)$

7b. Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$

7c. Domain: $[-2, \infty)$
Range: $[1, \infty)$

7d. Domain: $[0, \infty)$
Range: $(-\infty, \infty)$

7e. Domain: $[-4,4]$
Range: $[-4,4]$

8a. $2x^3 - \frac{1}{8}x + 5$

8b. $2x^3 + x^2 + 4x$

8c. $3x^3 + 12x$

8d. $6x^2 - x - 12$

8e. $9x^2 - 12x + 4$

8f. $4x^3 - 14x^2 + 26x - 21$