

Name: _____

Date: _____

Algebra II Honors Prerequisite Skills

This work is designed to give students entering Algebra II Honors a fair appraisal of the skills they will need from day one in Algebra II Honors. These skills are the foundational building blocks for the Algebra II Honors curriculum. Skill completion and fluency are both important factors as students advance in mathematics, so time guidelines are listed to give a benchmark. The goal: Complete each item in the time allowed, show work, and check answers provided on the district website under DHHS Summer Math.

A: Number Fluency

Simplify each expression without a calculator. 10 min for page

1) $20 - 10 \div 5 \cdot 2$

2) $(-4)^3 - 2^2 + 16$

3) $-6 + 8 \cdot (-2)^2 - 3^3$

4) $\frac{-36}{9} + 5(-2)^3$

5) $\frac{|-4| - 4^2}{\sqrt{36}}$

6) $\sqrt{48} + \sqrt{24} - \sqrt{300}$

B: Fraction Operations

Simplify completely. Show all work. No calculators should be used. 20 min for page

1) $\frac{3}{4} + \frac{5}{6}$

2) $\frac{7}{8} - \frac{11}{12}$

3) $\frac{2}{3} \cdot \frac{9}{10}$

4) $\frac{5}{6} \div \frac{2}{9}$

5) $\frac{4}{5} + \frac{3}{10} - \frac{1}{2}$

6) $\left(\frac{2}{3}\right)^2 \cdot \left(\frac{3}{4}\right)^3$

7) $\frac{\frac{3}{4} + \frac{1}{2}}{\frac{5}{6}}$

8) $\frac{\frac{7}{9} - \frac{2}{3}}{\frac{5}{12}}$

9) $\frac{\frac{1}{2} + \frac{3}{4}}{\frac{2}{3} \cdot \frac{9}{8}}$

9) $\frac{2}{3} \div \left(\frac{4}{5} + \frac{1}{10}\right)$

10) $\frac{\frac{5}{8}}{\frac{3}{4} - \frac{1}{2}}$

11) $1\frac{2}{3} + \frac{2}{3} \left(\frac{1}{3} - \frac{4}{6}\right)$

12) A recipe calls for $\frac{3}{4}$ cup sugar. You make $\frac{2}{3}$ of the recipe. How much sugar do you use?

C. Exponents.

Simplify completely. Answers should only include positive exponents. Show all work. No calculators should be used. 20 min for page.

1) $\frac{m^{13}}{m^5}$

2) $a^2 \cdot a^7$

3) $\frac{x^3 \cdot x^7}{x^{11}}$

4) $(x^3 \cdot x^5)^2$

5) $(x + y)^2$

6) $\frac{x^{-3}}{y^{-2}}$

7) $(m^3 n^{-2} x^5)^0$

8) $(x^{-2} y^{-1})^2$

9) $\frac{(x^2 y^{-1})^3}{x^4}$

For 10 and 11, state your answers in proper scientific notation

10) $(32 \cdot 10^4)(2 \cdot 10^5)$

11) $\frac{50 \cdot 10^{-1}}{100 \cdot 10^7}$

12) Jada saw a music video that her favorite artist recently posted online.

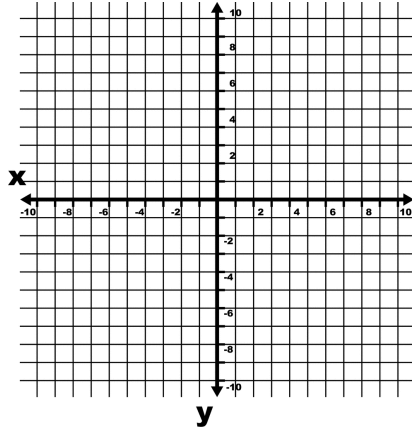
The function $v(t) = 320 \cdot 4^t$ represents the number of views of the video, t days since Jada saw the video.

- How many people watched the video by the same day Jada saw the video? How do you know?
- Find the value of $v(t)$ when $t = -2$. What does $v(-2)$ represent in this situation?

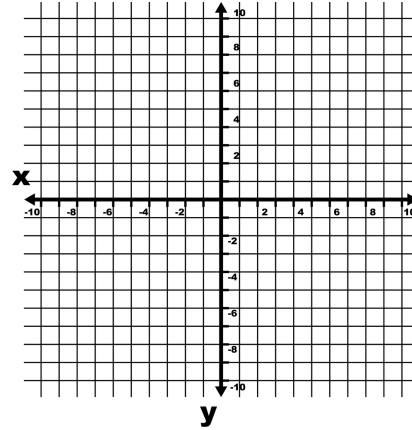
D. Graphing

Graph each function.

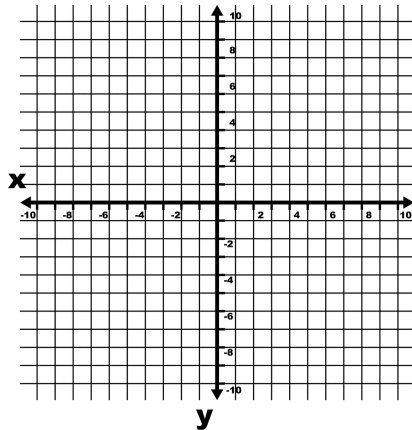
1) $y = 2x - 3$



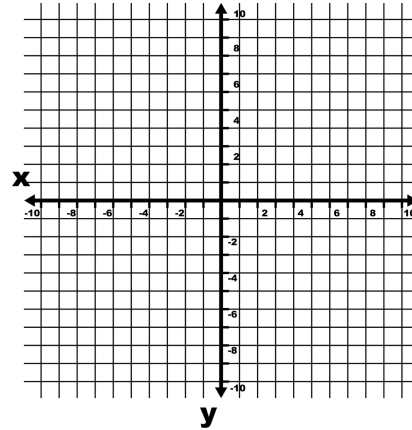
2) $y - 3 = \frac{1}{2}(x + 2)$



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



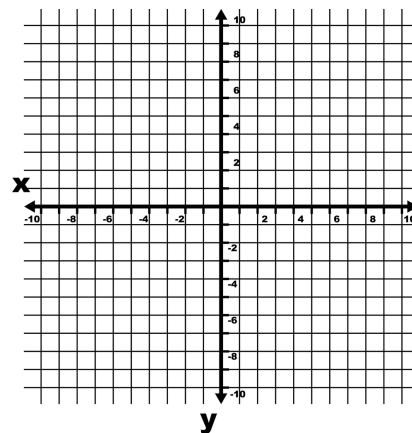
4) $y = (x - 2)^2 + 1$

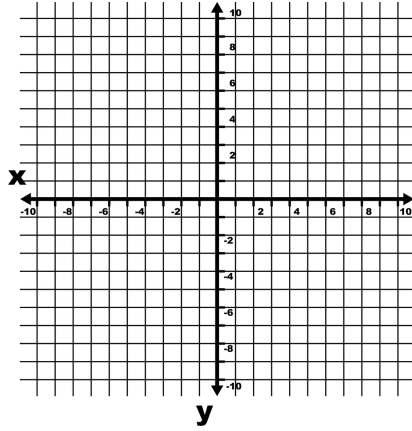


Solve each system by graphing. State the solution as an ordered pair.

5) $x = 2,$
 $y = -4$

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





E. Factoring

Factor each polynomial completely. 15 min for page.

1) $x^2 + 7x + 10$

2) $x^2 - 9x + 20$

3) $x^2 + 5x - 14$

4) $2x^2 + 7x + 3$

5) $3x^2 - 11x - 4$

6) $6x^2 + x - 2$

7) $x^2 - 16$

8) $9x^2 - 25$

9) $x^2 + 10x + 25$

10) $4x^2 + 12x + 9$

11) $x^4 - 81$

12) $x^4 + 5x^2 + 6$

F. Solving Systems of Equations

Solve each method with the identified method. No calculators. 20 min for the page

Solve 1-3 by substitution:

1) $y = 2x + 3$
 $3x + y = 15$

2) $y = x^2$
 $y = 4x - 3$

3) $x = y + 1$
 $x^2 + y^2 = 25$

Solve by elimination

4) $2x + 3y = 13$
 $4x - 3y = 5$

5) $3x - 2y = 4$
 $5x + 2y = 16$

6) $2x + y = 7$
 $4x + 2y = 14$

Write a system and then solve it using any method.

7) A school play sold 120 tickets. Adult tickets cost \$10 and student tickets cost \$5. Total revenue was \$850. Find number of student tickets sold.

8) A rectangle has an area of 96 cm. Its length is 4 more than its width. Find the dimensions of the rectangle.

G. Solving quadratic equations

Solve each quadratic equation using the specified method. No calculators. 20 min for page.

Factoring #'s 1-3

1) $x^2 + 5x + 6 = 0$

2) $2x^2 - 7x + 3 = 0$

3) $x^2 - 16 = 0$

Completing the Square #'s 4-5

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

5) $x^2 - 4x - 1 = 0$

Quadratic Formula #'s 6-7

6) $2x^2 + 3x - 1 = 0$

7) $x^2 + 10x + 7 = 0$

Any method

8) If the path of a baseball is modelled by the function $h(t) = -16t^2 + 32t + 5$, where t is the time spent in flight and $h(t)$ is the height of the ball at time t ,

a) What is the height of the ball when it is initially hit?

b) When does the ball hit the ground?