

## HONORS PRE-CALC SUMMER PREP WORK

**Name:** \_\_\_\_\_

This prep work should be completed, to the best of your ability, by the first day of school. Please note; all of the material in the prep work was covered in previous math classes, there are no excuses.

**This prep work will be checked on the first day of class and will be collected on the second day of class. The prep work will count as your first TEST grade for the year.**

Success in Honors Pre-Calculus requires an understanding of:

1. Expressions & Equations
  - Simplifying
  - Solving
  - Factoring
2. Radical and Rational Exponents
3. Linear Equations
  - Graphing
  - Writing Equations
4. Systems of Equations
  - Graphing
  - Substitution
  - Elimination

Being able to complete these skills on both a Ti-84 Calculator and by hand is necessary for success in Honors Pre-Calculus. The review has been designed to specifically target the skills listed above in order to help you become better prepared for Honors Pre-Calculus.

**SECTION 1: Expressions & Equations**

Circle your final answer. All work must be shown!

<b>1. Simplify</b> $-2x + 4y - 10 + x$	<b>2. Simplify</b> $4y + 6x - 3(x - 2y)$
<b>3. Simplify</b> $\frac{1}{2}(x - 3)^2 - \frac{3}{2}$	<b>4. Simplify</b> $5(x^2 - 9x) - 2(3x + 4) + 7$
<b>5. Simplify</b> $2(x - 3)(x + 2)$	<b>6. Simplify</b> $(x + 4)^2$
<b>7. Simplify</b> $(5x + 8)(4x + 1)$	<b>8. Solve</b> $\left 1 - \frac{3}{4}x\right  + 2 = 4$
<b>9. Solve</b> $ 5x + 11  = 9$	<b>10. Solve</b> $\frac{2x}{5} - x = \frac{x}{40} - \frac{9}{8}$
<b>11. Solve</b> $4(-3x + 1) = -10(x - 4) - 14x$	<b>12. Solve</b> $2x + 11 = 15 - 6x$

**13. The formula for the volume of a cylinder is  $V = \pi r^2 h$ . Solve the equation for  $h$ . How tall is a cylindrical can with a radius 3 cm and volume 200 cm<sup>3</sup> ?**

<b>14. Factor</b> $x^2 - 121$	<b>15. Factor</b> $18x^2 - 2$
<b>16. Factor</b> $49 - 100x^2$	<b>17. Factor</b> $x^2 - 5x - 24$
<b>18. Factor</b> $2x^2 + 7x + 3$	<b>19. Factor</b> $3x^2 + 32x - 11$
<b>20. Factor</b> $6x^2 - 18x - 24$	<b>21. Factor</b> $5x^3 - 245x$
<b>22. Factor</b> $3x^3 + 12x^2 + 8x + 32$	<b>22. Factor</b> $12x^3 + 2x^2 - 30x - 5$

Solve the following equations:

**23.**  $5x^2 - 7x + 2 = 0$

**24.**  $3x^2 = -12x - 2$

**25.**  $4x^2 - 25 = 0$

**26.**  $2x^2 - 4x - 8 = -x^2 + x$

**27.**  $x^2 + 9x + 14 = 0$

**28.**  $2x^2 - 3x = 8$

**29.**  $x^2 - 6x + 8 = 0$

**30.**  $10x^2 - 14x = 0$

## SECTION 2: Radical & Rational Exponents

Circle your final answer. All work must be shown!

Simplify each of the following expressions as much as possible.

31. $(2f^5g^3)(-4f^2g^4)$	32. $\frac{6m^4n^{-3}}{8m^{-2}n^{-5}}$
33. $(3x^5y^6)^2$	34. $\left(\frac{6m^4n^{-3}}{8m^{-2}n^{-5}}\right)^0$

Rewrite each expression with Fractional Exponents & Simplify:

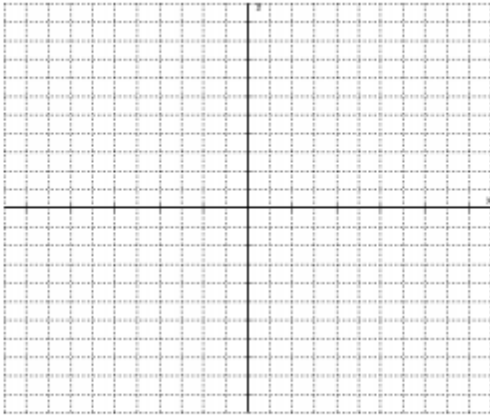
35. $\sqrt[3]{x} \sqrt[5]{y^2}$	36. $\sqrt{x+2} \sqrt[4]{(x+2)^9}$
37. $x^3 \sqrt[5]{x^3}$	38. $(x+6)^4 \sqrt[3]{x+6}$

Rewrite each expression with Radicals & Simplify:

39. $x^{5/3} =$	40. $16^{7/4} =$
41. $8(x+2)^{5/2} =$	42. $(64x)^{3/2} =$

## SECTION 3: Linear Equations

43. Graph  $y = -\frac{2}{3}x + 3$

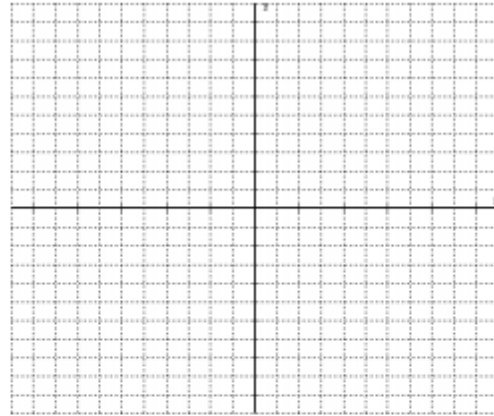


x-intercept = \_\_\_\_\_

y intercept = \_\_\_\_\_

slope = \_\_\_\_\_

44. Graph  $y = -3$

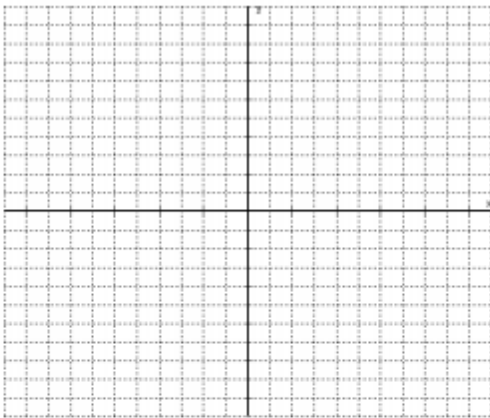


x-intercept = \_\_\_\_\_

y intercept = \_\_\_\_\_

slope = \_\_\_\_\_

45. Graph  $5x - 2y = 10$

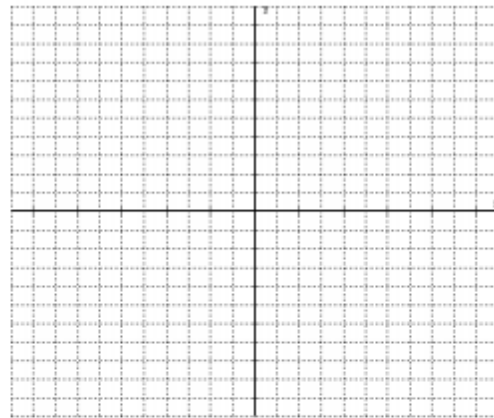


x-intercept = \_\_\_\_\_

y intercept = \_\_\_\_\_

slope = \_\_\_\_\_

46. Graph  $x = 4$



x-intercept = \_\_\_\_\_

y intercept = \_\_\_\_\_

slope = \_\_\_\_\_

**Slopes and Equations**  $y - y_1 = m(x - x_1)$

47. What is the slope of the line through M=(0, -3) and N=(2, -1)?

48. Write the equation of the line through M=(0, -3) and N=(2, -1) in point-slope form.

**SECTION 4: Solving Systems of Equations**

Circle your final answer. All work must be shown!

Use Elimination, Substitution or Graphing to solve:

<b>49.</b> $y = -\frac{3}{2}x - 4$ $y = -\frac{1}{2} + 1$	<b>50.</b> $y = -5x + 41$ $-2x = -14 - 2y$
<b>51.</b> $y = 3x + 6$ $-6x + 2y = 12$	<b>52.</b> $4x - y = -2$ $4x + 5y = 10$

**53.** Tickets for the school play are \$3 for students and \$5 for non-students. On opening night 937 tickets are sold and \$3943 is collected. How many tickets were sold to students? To non-students?

**54.** In 1990 a 4-function calculator cost \$45. In 1995 a 4-function calculator cost \$5. Find the average rate of change in the cost of calculators in dollars per year.

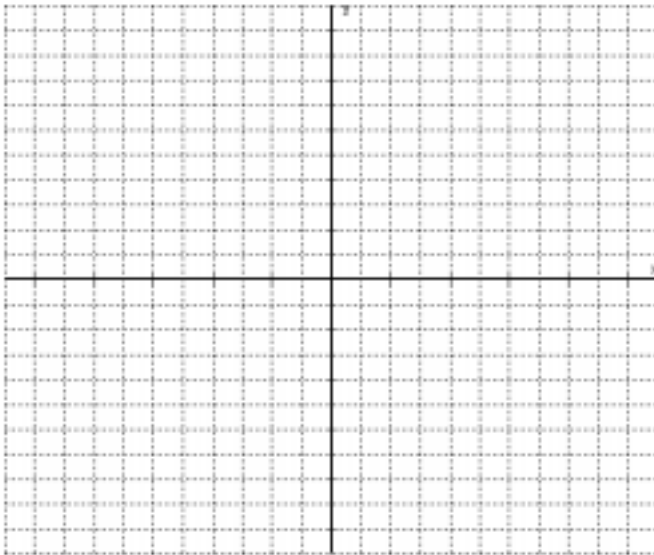
**55.** Your school biology club is organizing a pancake breakfast to raise \$400 for a trip to an aquarium. You decide to charge \$2 for each child and \$5 for each adult.

**a)** Write an equation to show the relationship between the number of people and the amount of money raised.

**b)** How many adult tickets would you have to sell in order to sell only adult tickets to raise the money for the trip?

**c)** How many child tickets would you have to sell in order to sell only child tickets to raise the money for the trip?

**d)** Graph the equation you came up with in part a.



**e)** How many adult tickets do you need to sell if you sold 45 child tickets?



## Mathematical Ideas You are Expected to Know

### Area

$$\text{Rectangle } A = bh$$

$$\text{Circle } A = \pi r^2$$

$$\text{Triangle } A = \frac{1}{2}bh$$

$$\text{Trapezoid } A = \frac{1}{2}(b_1 + b_2)h$$

### Volume

$$\text{Rectangular Prism } V = l \cdot w \cdot h$$

$$\text{Sphere } V = \frac{4}{3}\pi r^3$$

$$\text{Cone } V = \frac{1}{3}\pi r^2 h$$

$$\text{Cylinder } V = \pi r^2 h$$

### Properties of Exponents

$$x^a \cdot x^b = x^{a+b}$$

$$(x^a)^b = x^{ab}$$

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

$$x^{-a} = \frac{1}{x^a}$$

$$x^0 = 1$$

$$x^{a/b} = \sqrt[b]{x^a}$$