

Entering Algebra 2 – Summer Packet

This summer packet is for students ENTERING Algebra 2 and Honors Algebra 2.

Welcome back to the world of Algebra! There is a major shift in expectation for students to be able to recall many skills at a moment's notice. Certain concepts that have been taught to you over the previous years are assumed to be mastered. If you do not have these skills, you will find that you will consistently get problems incorrect next year as you make mistakes. It is frustrating for students who spend much of their homework time relearning algebra concepts in addition to learning how to tie the concepts together. This summer packet is intended for you to brush up and possibly relearn these topics.

On the following pages, you have assorted problems related to specific topics. Each problem should be done in the space provided. Rather than give you a textbook to remind you of the formulas and techniques necessary to solve the problem, there are a few websites that are listed below that have full instructions and brief refreshers at the beginning of some topics. **Don't fake your way through these problems. You are only setting yourself up for a future struggle!**

Realize also that many concepts are interrelated. This will be the focus throughout next year as we examine the mathematical relationships between topics numerically, algebraically, and graphically. While you may be strong in one of these approaches, you must learn to view each topic from the other two approaches as well to achieve full understanding. Success on your tests and quizzes throughout the year will depend on you being able to do so.

We want you to get off to a good start so spend some quality time on this packet this summer. Work needs to be shown when needed. Also, do not rely solely on the calculator to work through but you are expected to have strong calculator skills.

This packet is to be completed by the first day of school. This summer packet is a study guide for your first assessment in the course. You will work through any questions you have with your teachers in the first couple of days so come prepared to lead the discussion! You will also be expected to efficiently work through the problems under time constraints. Many students are not prepared for this expectation and find they do not have the time to check their answers like they are used to. Prepare accordingly.

It is a mistake to do this now. Let it go until mid-summer. We want these techniques to be relatively fresh in your mind in the fall. But, do not wait to do them at the very last minute. These take time. If you do a few concepts a day, the whole packet will take you about a week to complete.

We hope you take this seriously as we sincerely wish for you to be successful throughout this next year. Your preparation over the summer will be rewarded in unexpected ways during the school year.

Here are some helpful websites to use, if needed:

Use www.khanacademy.org to find specific math-related topics with accompanying videos.

Use www.patrickjmt.com to find specific math-related topics with accompanying videos.

Use www.youtube.com to find specific math-related topics with accompanying videos.

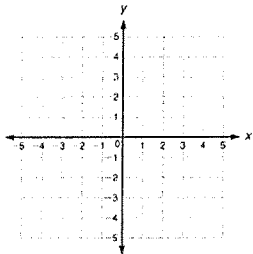
Solve each equation.

1. $-x - 9 = x + 3$	2. $7r - 4 + 2r = 12 + 7r$
3. $-5 - 4(n + 3) = -19 - 3n$	4. $-3(3 - k) = 3(k + 3)$

Solve for the indicated variable.

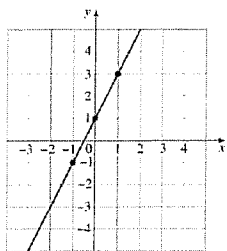
5. $d = rt$ for r	6. $ax + by + c = 0$ for y
7. $A = \frac{e + f}{2}$ for e	8. $3k + 7n = p$ for k

Use intercepts to graph the line described by the equation.

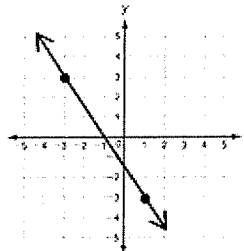
9. $4x + 3y = -12$	
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Find the slope of the line.

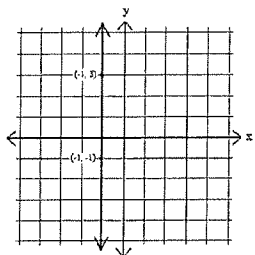
10.



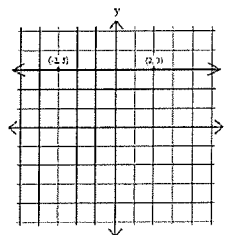
11.



12.



13.



Find the slope of the line that contains each pair of points.

14. $(3, 10)$ and $(2, 5)$

15. $(12, -2)$ and $(0, 6)$

Find the slope of the line described by each equation.

16. $5x + 4y = 40$

17. $7x + 42 = 2y$

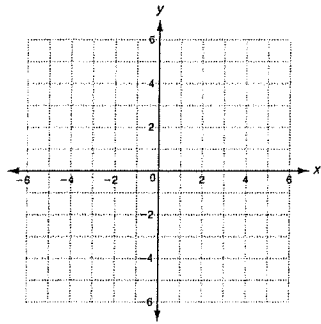
Write the equation that describes each line in slope-intercept form.

18. slope = 8; y-intercept = -6

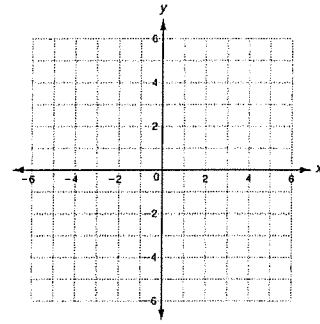
19. slope = $-\frac{1}{2}$, $(8, -1)$ is on the line

Write each equation in slope-intercept form. Then graph the line described by the equation.

20. $y + x = 3$



21. $5x - 2y = 10$



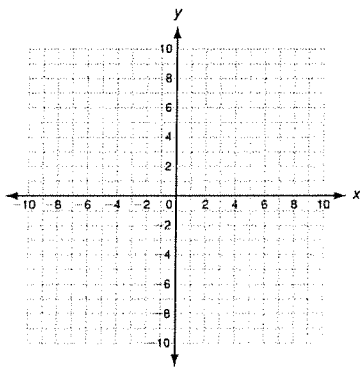
Write an equation in point-slope form for the line with the given slope that contains the given point.

22. slope = 4; (5, 6)

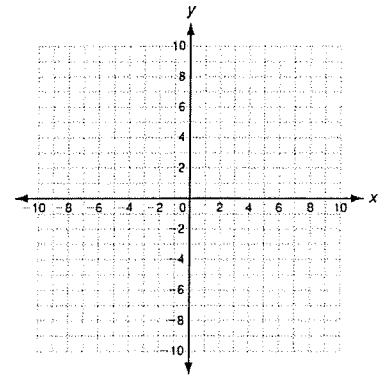
23. slope = -3; (7, -2)

Graph the line described by each equation.

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

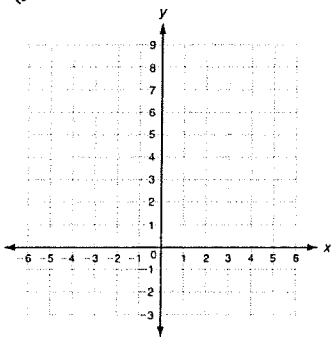


25. $y + 4 = -3(x - 4)$

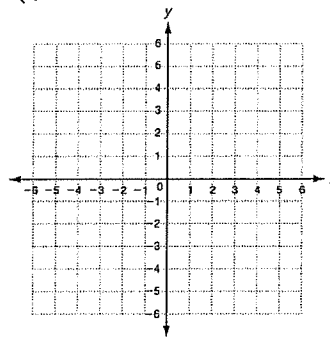


Solve each system by graphing.

26. $\begin{cases} y = 2x + 3 \\ y = -x + 9 \end{cases}$ Solution: _____



27. $\begin{cases} y = -3x + 4 \\ y = 2x + 4 \end{cases}$ Solution: _____



Solve each system by substitution.

$$28. \begin{cases} y = 3x + 4 \\ y = 4x + 5 \end{cases}$$

$$29. \begin{cases} -2x + 2y = 4 \\ 4x + 3y = -15 \end{cases}$$

Solve each system by elimination.

$$30. \begin{cases} x + 6y = -8 \\ 7x + 2y = 24 \end{cases}$$

$$31. \begin{cases} 9x + 6y = 12 \\ -18x - 8y = -4 \end{cases}$$

Evaluate each expression for the given value(s) of the variable(s).

$$32. (3t)^{-3} \text{ for } t = 2$$

$$33. 4x^{-2}y^0 \text{ for } x = 7 \text{ and } y = -4$$

Add or subtract.

$$34. 12x^2 + 11y^2 - 5x^2$$

$$35. (-8k^2 + 5) - (3k^2 + 7k - 6)$$

Multiply.

36. $-4x(x^2 - 5x + 7)$	37. $(y - 7)(y - 4)$
38. $(x - 4)^2$	39. $(5x + 2)^2$

Factor each polynomial. (GCF)

40. $12c^3 - 5c$	41. $6x^2 - 18x + 6$
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Factor each polynomial.

42. $x^2 + 11x + 28$	43. $x^2 - 8x + 7$
44. $x^2 - 2x - 24$	45. $x^2 + 4x - 21$
46. $1 - 9x^2$	47. $64x^2 - 1$

Use the Zero Product Property to solve each equation. Check your answer.

$$48. (x-4)(x-3)=0$$

$$49. x(x+13)=0$$

Solve each quadratic equation by factoring. Check your answer.

$$50. x^2 + 2x - 15 = 0$$

$$51. x^2 - 5x - 6 = 0$$

Solve using square roots. Check your answer.

$$52. x^2 = 64$$

$$53. x^2 = 900$$

$$54. 9x^2 + 20 = 189$$

$$55. 0 = 49x^2 - 16$$

Solve by completing the square.

$$56. x^2 + 10x = -21$$

$$57. -x^2 + 6x - 3 = 0$$

Solve using the Quadratic Formula.

58. $x^2 + 7x - 6 = 0$

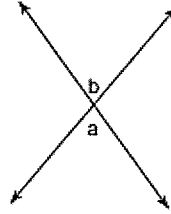
59. $2x^2 - x - 11 = 0$

Name the relationship(s): complementary, supplementary, vertical, or adjacent.

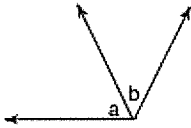
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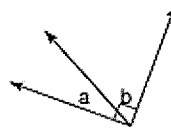
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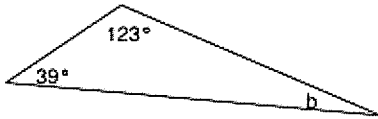


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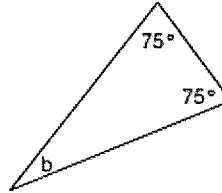


Find the measure of angle b .

64.

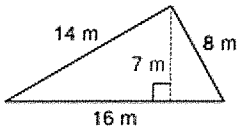


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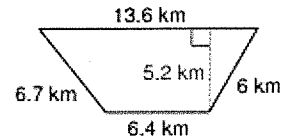


Find the perimeter of each figure.

66.

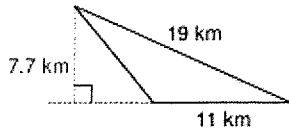


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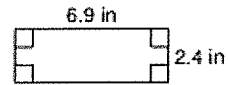


Find the area of each figure.

68.



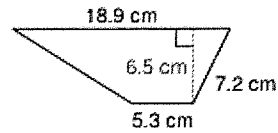
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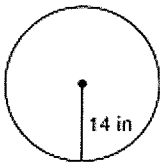


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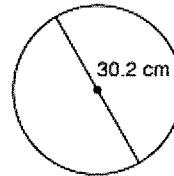


Find the area and circumference of each circle.

72.

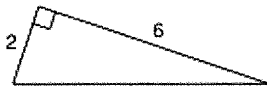


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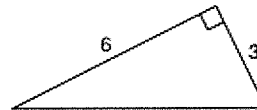


Use the Pythagorean Theorem to find the missing length.

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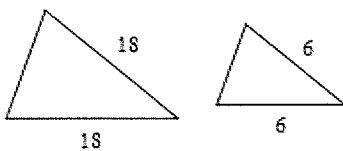


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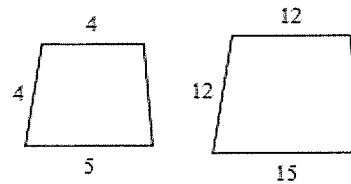


The polygons in each pair are similar. Find the scale factor of the smaller figure to the larger figure.

76.

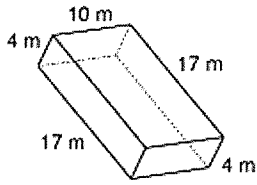


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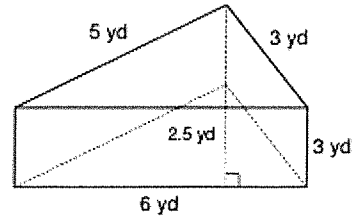


Find the volume of each figure – see formulas below.

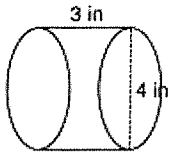
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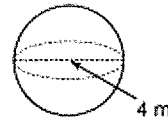
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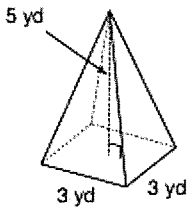
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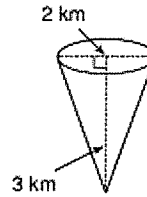
81.



82.



83.



Volume Formulas		
Prism $V = Bh$	Pyramid $V = \frac{1}{3} Bh$	Cylinder $V = \pi r^2 h$
Cube $V = s^3$	Cone $V = \frac{1}{3} \pi r^2 h$	Sphere $V = \frac{4}{3} \pi r^3$