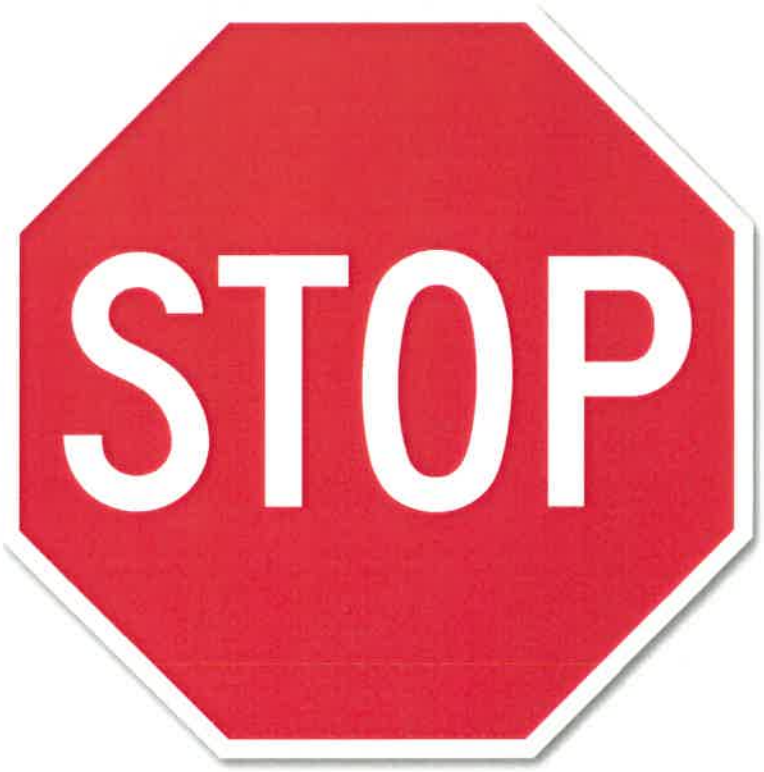
Post Geometry

Summer Homework

Name: _____



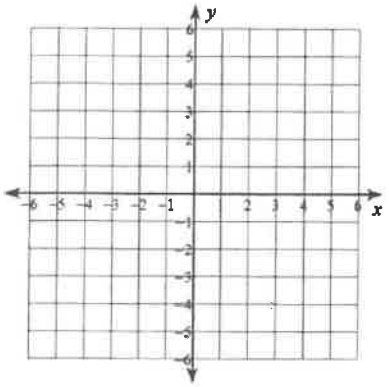
Please do not begin this packet until you have read the instructions! The instructions can be found in a separate link on the CSN website. Most importantly, please make sure you have read and understood what you will be turning in to your teacher and how you will be graded. ALL TEACHERS REQUIRE WORK TO BE SHOWN FOR ALL PROBLEMS. If you have questions about the Summer Math Homework, please contact your teacher or Ms. Cankar.

Ms. Cankar:
bcankar@communityschoolnaples.org

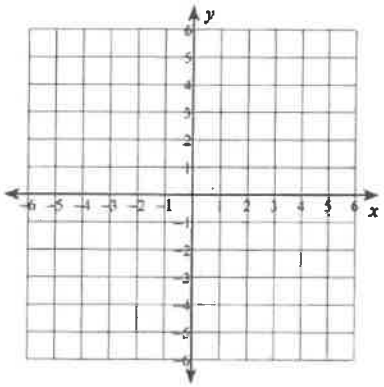
Review: Graphing and Writing Linear Equations

Sketch the graph of each line.

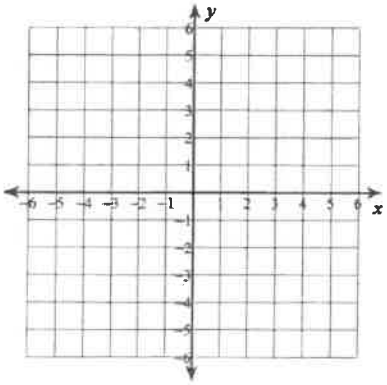
1) x-intercept = –2, y-intercept = –4



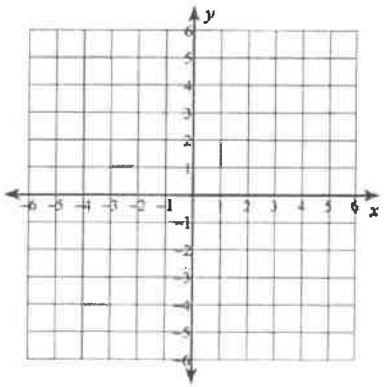
2) x-intercept = –5, y-intercept = –5



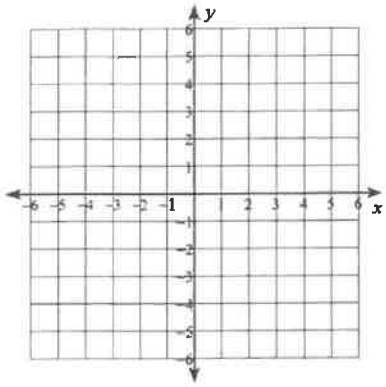
3) $x + 2y = -6$



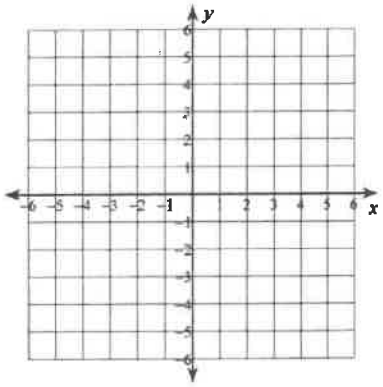
4) $y = -1$



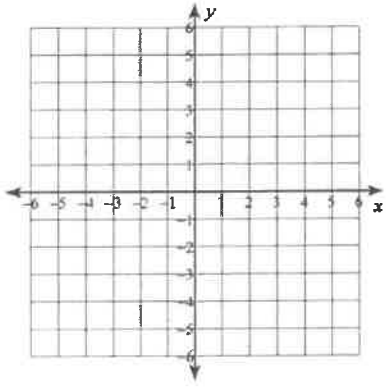
5) $y = 5x + 1$



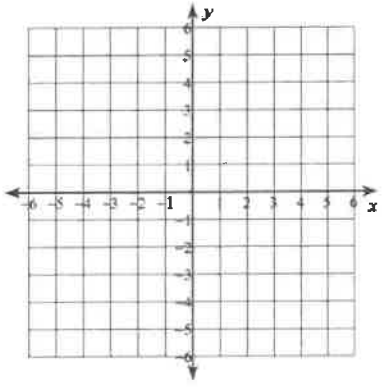
6) $y = -2x + 3$



7) $5y = 3x - 20$

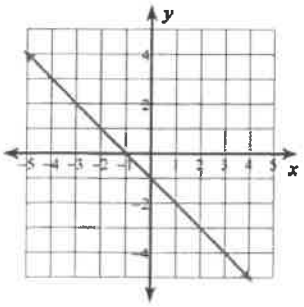


8) $-x = -1$



Write the slope-intercept form of the equation of each line.

9)



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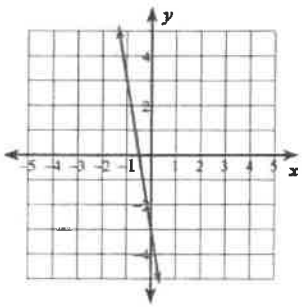
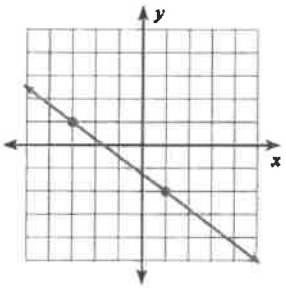
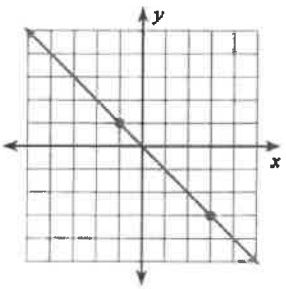


Find the slope of each line.

11)



12)



Find the slope of the line through each pair of points.

13) (14, 20), (19, 4)

14) (−14, 0), (−13, −20)

Write the slope-intercept form of the equation of each line.

15) $x+8=-2y$

16) $-9=-x-3y$

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

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

Write the slope-intercept form of the equation of each line given the slope and y-intercept.

19) Slope $=-\frac{5}{3}$, y-intercept $=4$

20) Slope $=5$, y-intercept $=5$

Write the point-slope form of the equation of the line through the given point with the given slope.

21) through: $(-1, 3)$, slope $=-2$

22) through: $(2, -5)$, slope $=-3$

Write the slope-intercept form of the equation of the line through the given points.

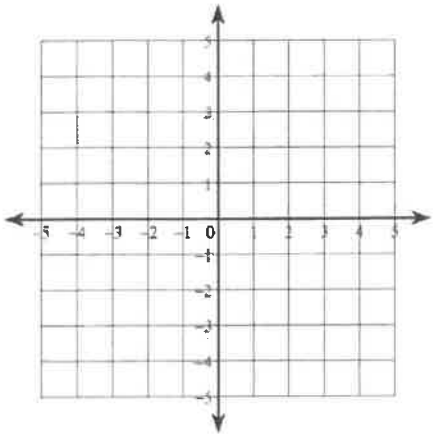
23) through: $(-4, 3)$ and $(-2, 3)$

24) through: $(5, 3)$ and $(-5, -4)$

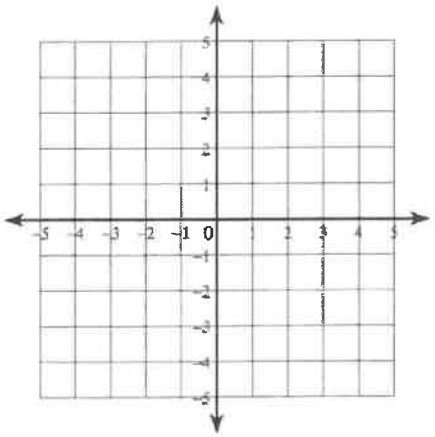
Systems of Two Equations

Solve each system by graphing.

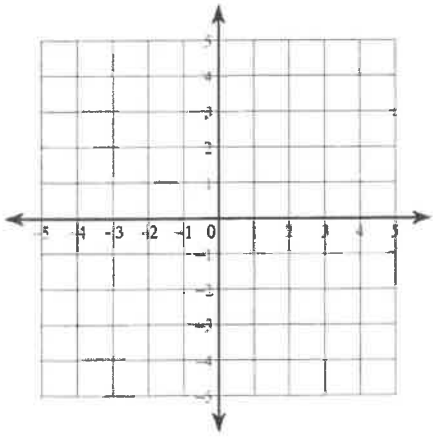
1) $y = -3x + 4$
$y = 3x - 2$



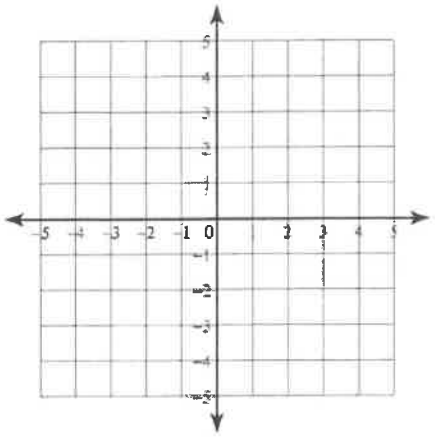
2) $y = x + 2$
$x = -3$



3) $x - y = 3$
$7x - y = -3$



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



Solve each system by substitution.

5) $y = 4x - 9$
$y = x - 3$

6) $4x + 2y = 10$
$x - y = 13$

7) $y = -5$
$5x + 4y = -20$

8) $x + 7y = 0$
$2x - 8y = 22$

9) $6x + 8y = -22$
$y = -5$

10) $-7x + 2y = 18$
$6x + 6y = 0$

11) $7x + 2y = -19$
$-x + 2y = 21$

12) $3x - 5y = 17$
$y = -7$

13) $-7x + 4y = 24$
$4x - 4y = 0$

14) $4x - y = 20$
$-2x - 2y = 10$

Solve each system by elimination.

15) $8x - 6y = -20$
$-16x + 7y = 30$

16) $6x - 12y = 24$
$-x - 6y = 4$

17) $-8x - 10y = 24$
$6x + 5y = 2$

18) $-24 - 8x = 12y$
$1 + \frac{5}{9}y = -\frac{7}{18}x$

19) $-4y - 11x = 36$
$20 = -10x - 10y$

20) $-9 + 5y = -4x$
$-11x = -20 + 9y$

21) $0 = -2y + 10 - 6x$
$14 - 22y = 18x$

22) $-16y = 22 + 6x$
$-11y - 4x = 15$

23) $-16 + 20x - 8y = 0$
$36 = -18y - 22x$

24) $-\frac{5}{7} - \frac{11}{7}x = -y$
$2y = 7 + 5x$

Critical thinking questions:

25) Write a system of equations with the solution $(4, -3)$.

Factoring Practice

I. Greatest Common Factor (GCF)

Find the GCF of the numbers.

$$18, 30$$
$$18 = 2 \cdot 3 \cdot 3$$
$$30 = 2 \cdot 3 \cdot 5$$
$$2 \cdot 3 = 6$$
$$6 = GCF$$

1. 12, 18
2. 10, 35
3. 8, 30
4. 16, 24
5. 28, 49
6. 27, 63
7. 30, 45
8. 48, 72

II. Greatest Common Monomial Factor

Factor, write prime if prime.

$$12a^3b + 15ab^3 = 3ab(4a^2 + 5b^2)$$

1. $6x + 3$
2. $24x^2 - 8x$
3. $6x - 12$
4. $2x^2 + 8x$
5. $4x + 10$
6. $10x^2 + 35x$
7. $10x^2y - 15xy^2$
8. $12x^2 - 9x + 15$
9. $3n^3 - 12n^2 - 30n$
10. $9m^2 - 4n + 12$
11. $2x^3 - 3x^2 + 5x$
12. $13m + 26m^2 - 39m^3$
13. $17x^2 + 34x + 51$
14. $18m^2n^4 - 12m^2n^3 + 24m^2n^2$

III. Factoring the Difference of Two Squares

$$a^2 - 36 = (a + 6)(a - 6)$$
$$3x^2 - 48 = 3(x^2 - 16) = 3(x + 4)(x - 4)$$

Factor, write prime if prime.

1. $x^2 - 1$
2. $x^2 - 9$
3. $x^2 + 4$
4. $x^2 - 25$
5. $9y^2 - 16$
6. $4x^2 - 25$
7. $9x^2 - 1$
8. $a^2 - x^2$
9. $25 - m^2$
10. $x^2 - 16y^2$
11. $25m^2 - n^2$
12. $-x^2 + 16$
13. $36m^2 - 121$
14. $2x^2 - 8$
15. $25 + 4x^2$
16. $4a^2 - 81b^2$
17. $12x^2 - 75$
18. $a^2b - b^3$
19. $-98 + 2x^2$
20. $5x^2 - 45y^2$
21. $9x^4 - 4$
22. $16x^4 - y^2$

IV. Factoring Perfect Square Trinomials

$$x^2 - 14x + 49 = (x-7)^2$$

Factor, write prime if prime.

1. $x^2 + 8x + 16$
2. $x^2 - 16x + 64$
3. $y^2 + 12y + 36$
4. $a^2 - 10a + 25$
5. $16y^2 + 8y + 1$
11. $25a^2 + 60a + 36$
12. $16 + 40x + 25x^2$
13. $16x^2 + 24x + 9$
14. $49x^2 - 14x + 1$
15. $9y^2 - 30y + 25$
6. $9x^2 - 6x + 1$
7. $25x^2 + 10x + 1$
8. $n^2 - 14n + 49$
9. $81x^2 - 90x + 25$
10. $4y^2 - 20y + 25$
16. $n^2 + 2n + 4$
17. $b^2 + 2b + 1$
18. $36x^2 + 84x + 49$
19. $81 - 18x + x^2$
20. $4 - 12y + 9y^2$

V. Special Factoring - Challenge

Factor, write prime if prime.

1. $a^2 - 36$
2. $9x^2 - 49$
3. $169m^2 - 4u^2$
4. $x^2y^2 - 9z^4$
5. $\frac{1}{4}x^2 - 25y^2$
6. $\frac{1}{9}x^2 - 16$
7. $64 - a^4b^4$
8. $y^6 - 100$
9. $\frac{4}{9}x^2y^2 - \frac{25}{36}z^2$
10. $y^8 - 81$
11. $1 - 8u + 16u^2$
12. $a^2b^2 + 6ab + 9$
13. $x^2 + 2xy + y^2$
14. $4x^2 + 12xy + 9y^2$
15. $100h^2 + 20h + 1$
16. $9a^2 - 24a + 16$
17. $4a^3 + 8a^2 + 4a$
18. $5c + 20c^2 + 20c^3$
19. $(x+4)^2 - (y+1)^2$
20. $(x-1)^2 - 10(x-1) + 25$

VI. Factoring Trinomials: $x^2 + bx + c$

$$x^2 + 7x + 10 = (x)^2 + (2+5)x + (2)(5) = (x+2)(x+5)$$

Factor, write prime if prime.

1. $x^2 + 6x + 8$
2. $c^2 + 5c + 6$
3. $y^2 - 9y + 14$
4. $x^2 - 10x + 16$
5. $a^2 + 12a + 27$
6. $x^2 - 14x + 24$
7. $x^2 - 15x + 36$
8. $y^2 + 21y + 54$
9. $m^2 + 13m - 36$
10. $x^2 - 8x + 15$
11. $y^2 - 4y - 32$
12. $x^2 - x - 6$
13. $y^2 + 3y - 18$
14. $b^2 + 7b - 18$
15. $a^2 + a - 56$
16. $c^2 - 4c - 12$
17. $x^2 - 9x - 36$
18. $y^2 + 4y - 21$
19. $x^2 - 22x - 75$
20. $x^2 - 3x - 40$
21. $45 + 14y + y^2$
22. $x^2 - 13x + 36$

VII. ...More Factoring Trinomials: $x^2 + bx + c$

$$k^2 - k - 20 = (k)^2 + (4 + -5)k + (4)(-5) = (k+4)(k-5)$$

Factor, write prime if prime.

1. $x^2 + 7x + 12$
2. $m^2 + 10m + 21$
3. $y^2 - 7y - 8$
4. $x^2 - 6x + 5$
5. $x^2 + 4x - 32$
6. $x^2 - 2x - 15$
7. $x^2 - 6x + 8$
8. $y^2 + 9y + 18$
9. $3 - 4t + t^2$
10. $v^2 + 12v + 20$
11. $51 - 20k + k^2$
12. $a^2 - 14ab + 24b^2$
13. $y^2 + 6y - 72$
14. $x^2 - 11xy - 60y^2$
15. $15r^2 + 2rs - s^2$
16. $3x^2 + 21xy - 54y^2$ (Hint: Check for GCF)
17. $x^2 - 5xy - 6y^2$
18. $x^2 + 8xy + 12y^2$
19. $y^2 - 7xy + 10x^2$
20. $a^2 - 11ab - 60b^2$

VIII. Factoring Trinomials: $ax^2 + bx + c$

$$2x^2 - 5x - 3 = (2x+1)(x-3)$$

Factor, write prime if prime.

1. $2x^2 - 5x - 3$
2. $3x^2 + 10x - 8$
3. $2y^2 + 15y + 7$
4. $7a^2 - 11a + 4$
5. $5n^2 + 17n + 6$
6. $4y^2 + 8y + 3$
7. $3x^2 + 4x - 7$
8. $2x^2 + 13x + 15$
9. $9y^2 + 6y - 8$
10. $6x^2 - 7x - 20$
11. $2n^2 - 3n - 14$
12. $5n^2 + 2n + 7$
13. $10x^2 + 13x - 30$
14. $12y^2 + 7y + 1$
15. $2n^2 + 9n - 5$
16. $2x^2 + 7x + 6$
17. $5a^2 - 42a - 27$
18. $15x^2 - 28x - 32$
19. $8a^2 - 10a + 3$
20. $2y^2 - 3y - 20$

IX. ...More Factoring Trinomials: $ax^2 + bx + c$

Factor, write prime if prime.

1. $3x^2 + 4x + x$
2. $5z^2 + 7z + 2$
3. $2n^2 - 11n + 5$
4. $3z^2 + z - 2$
5. $5h^2 - 2h - 7$
6. $8s^2 - 10st + 3t^2$
7. $6x^2 + 19x + 15$
8. $28a^2 + 5ab - 12b^2$
9. $2a^2 + 7ab - 15b^2$
10. $12x^2 + 17x + 6$
11. $4a^2 - 4ab - 5b^2$
12. $56y^2 + 15y - 56$
13. $12x^2 - 29xy + 14y^2$
14. $64x^2 + 32xy - 21y^2$
15. $16x^2 + 56xy + 49y^2$
16. $18x^2 - 57x + 35$

X. Factoring: Putting It All Together

$$5x^2 + 20x - 60 = 5(x^2 + 4x - 12) = 5(x+6)(x-2)$$

Factor Completely, write prime if prime.

1. $2x^2 - 8$
2. $2x^2 + 8x + 6$
3. $3n^2 + 9n - 30$
4. $6x^2 - 26x - 20$
5. $2x^2 + 12x - 80$
6. $5t^2 + 15t + 10$
7. $8n^2 - 18$
8. $14x^2 + 7x - 21$
9. $4x^2 + 16x + 16$
10. $18x + 12x^2 + 2x^3$
11. $2x - 2xy^2$
12. $3t^3 - 27t$
13. $24a^2 - 30a + 9$
14. $10x^2 + 15x - 10$
15. $3x^2 - 42x + 147$
16. $4x^4 - 4x^2$

XI. ...More Factoring: Putting It All Together

1. $16x^2 - 40x - 24$
2. $27x^2 - 36x + 12$
3. $5x^2 - 60x - 140$
4. $6m^3 + 54m^2 - 6m$
5. $5k^4 + 8k^3 - 4k^2$
6. $x^2y^4 - x^6$
7. $y^4 - 6y^2 - 16$
8. $x^4 - 3x^2 - 4$
9. $h^2 - (a^2 - 6a + 9)$
10. $81x^4 - 16y^4$
11. $4mn^2 - 4m^2n^2 + m^3n^2$
12. $(2a+3)^2 - (a-1)^2$
13. $16d^8 - 8d^4 + 1$
14. $x^2(x^2-4) + 4x(x^2-4) + 4(x^2-4)$

XII. Extra: Factoring by Grouping

$$\begin{aligned} 6ax - 2b - 3a + 4bx &= 6ax - 3a + 4bx - 2b \\ &= 3a(2x-1) + 2b(2x-1) \\ &= (2x-1)(3a+2b) \end{aligned}$$

1. $x^2 + 2x + xy + 2y$
2. $3a^2 - 2b - 6a + ab$
3. $t^3 - t^2 + t - 1$ Hint: $t - 1 = 1(t-1)$
4. $10 + 2t - 5s - st$
5. $\frac{2}{3}bc - \frac{14}{3}b + c - 7$
6. $4u^2 + v + 2uv + 2u$
7. $ad + 3a - d^2 - 3d$
8. $n^2 + 2n + 3mn + 6m$
9. $2ax^2 + bx^2 - 2ay^2 - by^2$
10. $yz^2 - y^3 + z^3 - y^2z$
11. $y^3 - y^2 - 4y + 4$
12. $x^2a + x^2b - 16a - 16b$
13. $x^3 + x^2 - x - 1$
14. $a^3 - a^2 - 8a + 8$

Algebra Review Solving Quadratics

I. Solve by Factoring

1.) $x^2 - 64 = 0$

2.) $x^2 - 6x - 16 = 0$

3.) $x^2 + 3x = 40$

4.) $2x^2 + 3x + 1 = 0$

5.) $x^2 - 100 = 0$

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

II. Solve by Square Roots

7.) $x^2 = 64$

8.) $4x^2 = 81$

9.) $x^2 + 7 = -300$

10.) $(x - 5)^2 = 36$

III. Solve by using the **quadratic formula:**

11. $x^2 + 3x + 2 = 0$

12. $4x^2 - 8x = 1$

13. $x^2 + 8x = 0$

Solve each equation any way you want. Show your work.

14. $x^2 + 11x + 18 = 0$

15. $x^2 + 2x + 1 = 15$

16. $7x^2 - 9x + 1 = 0$

17. $(x + 2)^2 = 36$

18. $x^2 - 10x + 25 = 0$

19. $x^2 + 3x + 7 = 0$

20. $x^2 = 36$ 21. $x^2 - 6x + 2 = 0$ 22. $x^2 - 5x + 4 = 0$

REASONING:

20.) Explain why $\mathbf{x^2 = -81}$ DOES NOT have a solution.

21.) Which method can't you use to solve this problem? $\mathbf{x^2 - 47 = 0}$

Circle one: Factoring Square Roots Quadratic Formula

Explain why:

22.) Which method can't you use to solve this problem? $x^2 + 7x = 0$

Circle one: Factoring Square Roots Quadratic Formula

Explain why:

23.) Which method can you use to solve all quadratic equations?

Circle one: Factoring Square Roots Quadratic Formula

Explain why:

24.) What are the **two mistakes** in setting up the quadratic formula:

Solve: $2x^2 - x - 6 = 0$ $x = \dfrac{-1 \pm \sqrt{(-1)^2 - 4(2)(6)}}{2(2)}$

Simplifying Radical Expressions

Simplify.

1) $\sqrt{125n}$

2) $\sqrt{216v}$

3) $\sqrt{512k^2}$

4) $\sqrt{512m^3}$

5) $\sqrt{216k^4}$

6) $\sqrt{100v^3}$

7) $\sqrt{80p^3}$

8) $\sqrt{45p^2}$

9) $\sqrt{147m^3n^3}$

10) $\sqrt{200m^4n}$

11) $\sqrt{75x^2y}$

12) $\sqrt{64m^3n^3}$

13) $\sqrt{16u^4v^3}$

14) $\sqrt{28x^3y^3}$

15) $\sqrt{36x^2y^3}$

16) $\sqrt{384x^4y^3}$

17) $7\sqrt{96m^3}$

18) $6\sqrt{72x^2}$

19) $-6\sqrt{150r}$

20) $5\sqrt{80a^2}$

21) $2\sqrt{125v}$

22) $-8\sqrt{24k^3}$

23) $-4\sqrt{192x}$

24) $2\sqrt{8p^2q^3r}$

25) $-4\sqrt{216x^2y^2z}$

26) $-3\sqrt{24a^4b^2c^3}$

27) $3\sqrt{16x^4y^4z}$

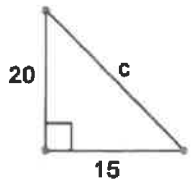
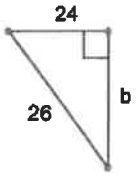
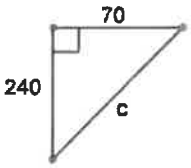
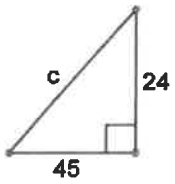
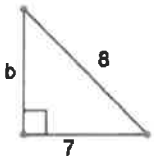
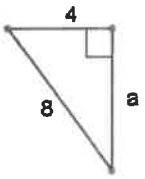
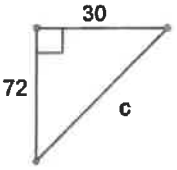
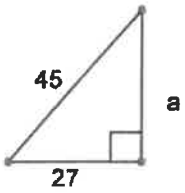
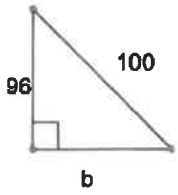
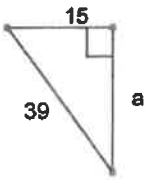
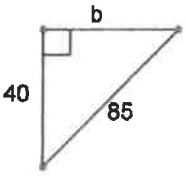
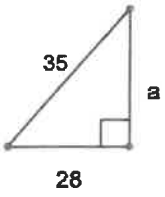
28) $-2\sqrt{48a^3b^4c^2}$

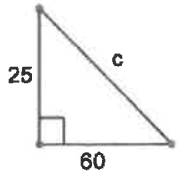
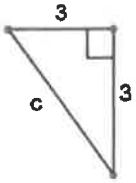
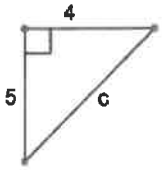
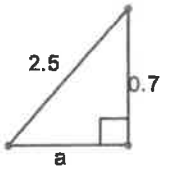
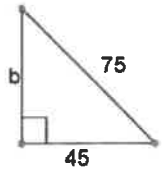
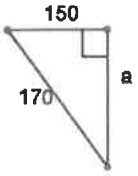
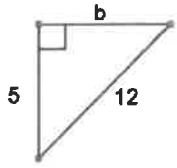
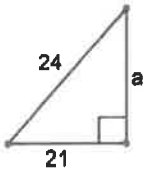
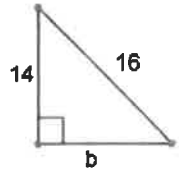
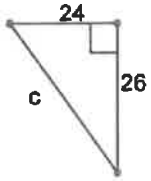
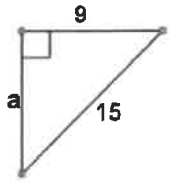
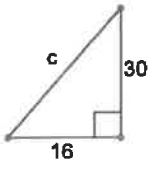
29) $6\sqrt{75mp^2q^3}$

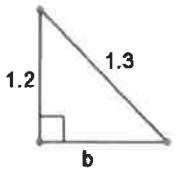
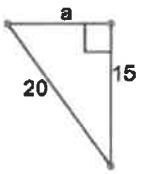
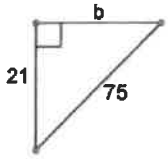
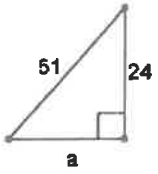
30) $4\sqrt{36x^2y^3z^4}$

Pythagorean Theorem

Use the Pythagorean theorem worksheet to find the missing side. Write the missing side in simplified radical form. Determine if the sides form a Pythagorean triple. If so, name the family.

1. Radical = _____ Triple? _____  	2. Radical = _____ Triple? _____  	3. Radical = _____ Triple? _____  	4. Radical = _____ Triple? _____ 
5. Radical = _____ Triple? _____  	6. Radical = _____ Triple? _____  	7. Radical = _____ Triple? _____  	8. Radical = _____ Triple? _____ 
9. Radical = _____ Triple? _____  	10. Radical = _____ Triple? _____  	11. Radical = _____ Triple? _____  	12. Radical = _____ Triple? _____ 

13. Radical = _____ Triple? _____ 	14. Radical = _____ Triple? _____ 	15. Radical = _____ Triple? _____ 	16. Radical = _____ Triple? _____ 
17. Radical = _____ Triple? _____ 	18. Radical = _____ Triple? _____ 	19. Radical = _____ Triple? _____ 	20. Radical = _____ Triple? _____ 
21. Radical = _____ Triple? _____ 	22. Radical = _____ Triple? _____ 	23. Radical = _____ Triple? _____ 	24. Radical = _____ Triple? _____ 

25.	26.	27.	28.
Radical = _____ Triple? _____ 	Radical = _____ Triple? _____ 	Radical = _____ Triple? _____ 	Radical = _____ Triple? _____ 

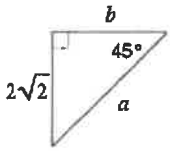
Use the converse of the Pythagorean theorem to determine if each triangle is acute, right, or obtuse. Show your work to justify your answer.

29. 11, 12, 16 _____	30. 6, 8, 9 _____	31. 45, 60, 75 _____
32. 11, 60, 61 _____	33. 6, 7, 12 _____	34. 5, 12, 13 _____

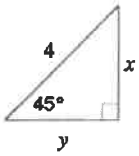
Special Right Triangles

Find the missing side lengths. Leave your answers as radicals in simplest form.

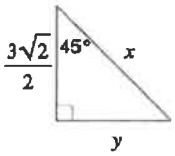
1)



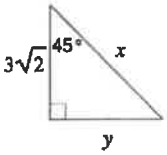
2)



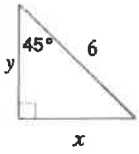
3)



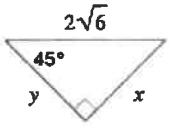
4)



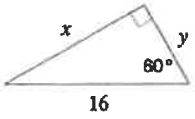
5)



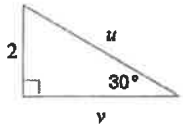
6)



7)



8)



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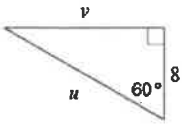

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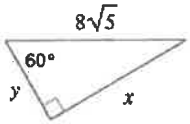
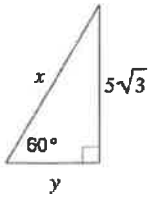
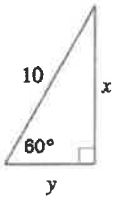


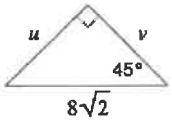
11)



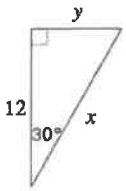
12)



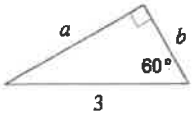
13)



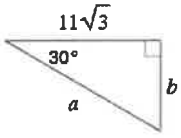
14)



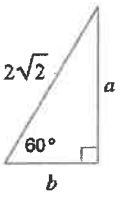
15)



16)



17)



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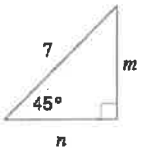
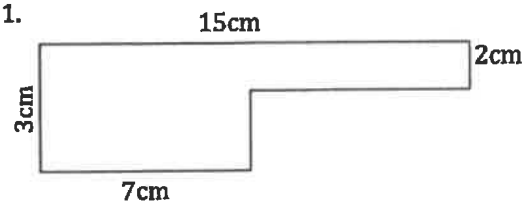
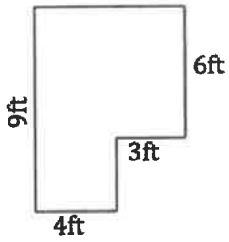


Find the area of each shape...

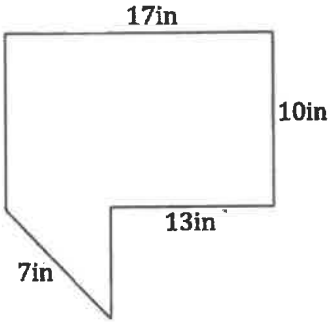
1.



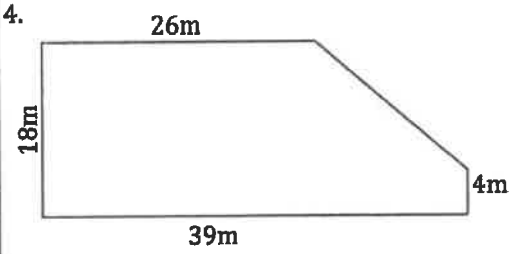
2.



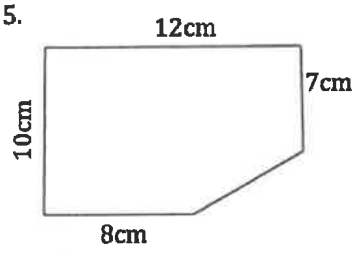
3.



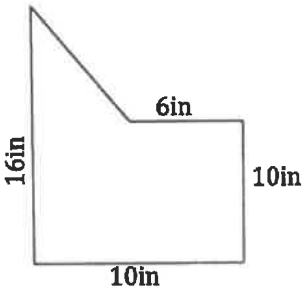
4.



5.



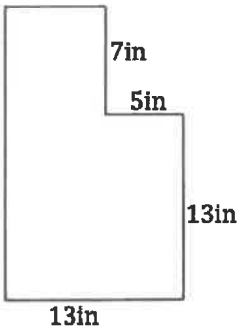
6.



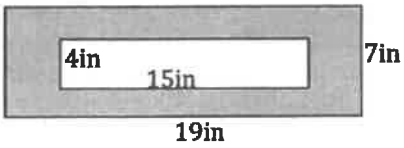
Bubble all the correct answers from above. Don't bubble incorrect answers.

○ 54 ○ 11.36 ○ 78 ○ 114 ○ 77 ○ 112 ○ 611 ○ 632 ○ 37 ○ 181.48

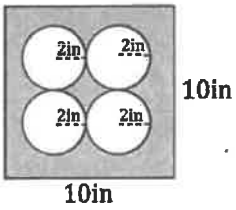
7.



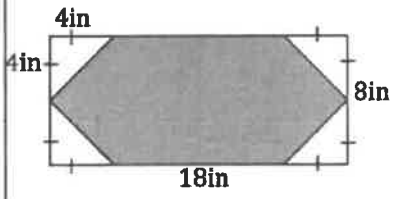
8. Find the shaded area.



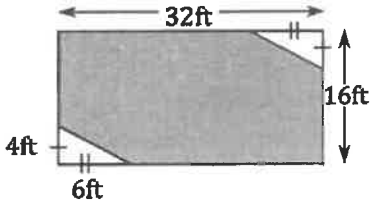
9. Find the shaded area.



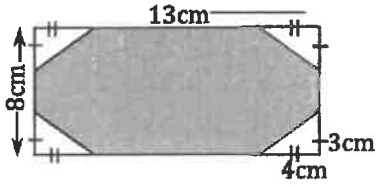
10. Find the shaded area.



11. Find the shaded area.



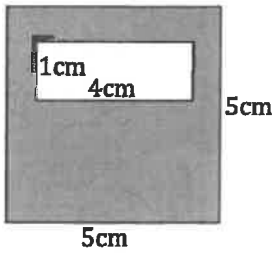
12. Find the shaded area.



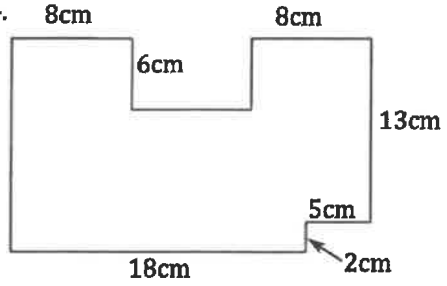
Bubble all the correct answers from above. Don't bubble incorrect answers.

○ 436 ○ 80 ○ 59.72 ○ 58.38 ○ 112 ○ 488 ○ 225 ○ 73 ○ 76 ○ 123

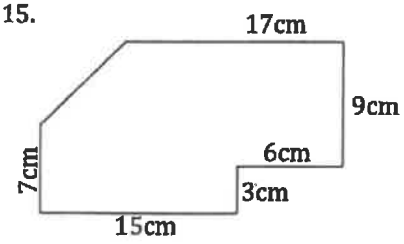
13. Find the shaded area.



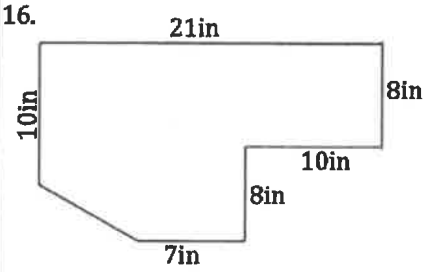
14.



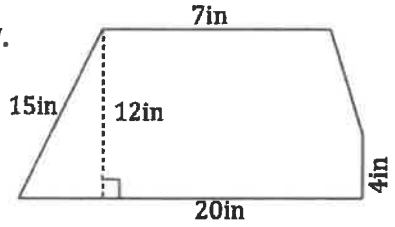
15.



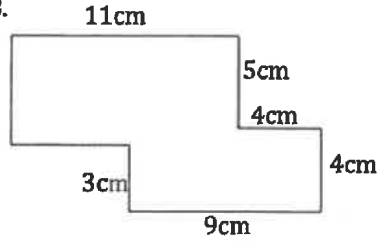
16.



17.



18.



Bubble all the correct answers from above. Don't bubble incorrect answers.

○ 244 ○ 256 ○ 160 ○ 97 ○ 170 ○ 215 ○ 224 ○ 293 ○ 306 ○ 21