PCTI Algebra II
Summer Packet 2021

Resources to use for assistance:
http://www.khanacademy.org
http://www.purplemath.com/modules
http://www.hippocampus.org
http://www.virtualnerd.com/algebra-1/all
http://www.mathsisfun.com/algebra/index.html

PCTI Mathematics Department
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Summer Packet Grading

- On the first day of school, the teacher will check for completion/effort of the packet.
- **This will be weighted at 50%.**
- Teacher will then review the packet with the students.
- Upon completion of the review, the students will be given an assessment based on the summer packet.
- **The assessment will be weighted at 50%.**
- **The two weighted scores combined will count as one project grade**.
- Therefore, the grade for the summer packet will be placed under the "project" category.

Multi-Step Equations

Solve each equation. Show all work and check your solutions

https://www.khanacademy.org/math/in-eighth-grade-math/linear-equations-one-variable/solvingequations-variable-both-sides/v/multi-step-equations-1

1. $-18 - 6k = 6(1 + 3k)$
2. $-3(4x + 3) + 4(6x + 1) = 43$
3. $24a - 22 = -4(1 - 6a)$
4. $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

Evaluating Functions

Evaluate each function.

https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-linear-equations-functions/8thfunctions-and-function-notation/v/understanding-function-notation-example-1

1. $f(x) = -2x + 1$; Find $f(-7)$
2. $f(x) = 4x - 2$; Find $f(x + 3)$
3. $f(x) = x - 2$; Find $f(x^2)$
4. $f(x) = x^2 - 5$; Find $f(x + 3)$

Properties of Exponents

Simplify. Your answer should contain only positive exponents.

https://www.khanacademy.org/math/pre-algebra/pre-algebra-exponents-radicals/pre-algebra-exponent-properties/v/exponent-properties-involving-products

1. $2m^2 \cdot 2m^3$

2. $4a^2b^2 \cdot 3a^{-4}b^{-3}$

3. $(4a^3)^2$

4. $(x^2)^0$

5. $(2x^2)^{-4}$

6. $\frac{6n^4}{2n^3}$

7. $\frac{r^2}{2r^3}$

8. $\frac{3m^{-4}}{m^3}$

Adding and Subtracting Polynomials

https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/adding-and-subtracting-polynomials/v/adding-and-subtracting-polynomials-3

1. $(-9xy^2 - 9x^4y^3) + (3xy^3 + 7y^4 - 8x^4y^4) + (3x^4y^3 + 2xy^3)$

2. $(4x^2 + 7x^3y^2) - (-6x^2 - 7x^3y^2 - 4x) - (10x + 9x^2)$

Multiplying Polynomials

https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/multiplying-polynomials-by-binomials/v/more-multiplying-polynomials

https://www.khanacademy.org/math/algebra-home/alg-polynomials/alg-multiplying-polynomials-by-binomials/v/multiplication-of-polynomials

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

2. $(3x + 7)(3x - 7)$

3. $(x + 4)^2$

4. $(3x - 1)^2$

Factoring

Factor each expression completely.

https://www.khanacademy.org/math/algebra-basics/quadratics-polynomials-topic/factoringquadratic-expressions-core-algebra/v/factoring-polynomials-1

https://www.khanacademy.org/math/algebra2/polynomial-functions/factoring-polynomials-quadraticforms-alg2/v/factoring-trinomials-by-grouping-4

1. $n^2 + 4n - 12$

2. $b^2 + 16b + 64$

3. $k^2 - 13k + 40$

4. $n^2 - n - 56$

5. $2n^2 + 6n - 108$

6. $3 + 6b + 3b^2$

7. $3p^2 - 2p - 5$

8. $3n^2 - 8n + 4$

9. $5n^2 + 19n + 12$

10. $9k^2 + 66k + 21$

11. $-6a^2 - 25a - 25$

12. $4b^2 - 4b + 1$

13. $n^2 - 25$

14. $9x^2 - 1$

Factoring by Grouping

Factor each completely.

https://www.khanacademy.org/math/algebra2/polynomial-functions/factoring-polynomialsquadratic-forms-alg2/v/factor-by-grouping-and-factoring-completely

1. $8r^3 - 64r^2 + r - 8$

2. $12x^3 + 2x^2 - 30x - 5$

3. $25v^3 + 5v^2 + 30v + 6$

Solving Quadratic Equations by Factoring

Solve each equation by factoring.

https://www.khanacademy.org/math/algebra-basics/quadratics-polynomials-topic/solving-quadraticsfactoring/v/example-1-solving-a-quadratic-equation-by-factoring

1. $k^2 - 4k - 5 = 0$

2. $4k^2 + 9k + 5 = 0$

3. $x^2 - 11x + 19 = -5$

4. $6n^2 - 18n - 18 = 6$

5. $7r^2 - 14r = -7$

6. $200m^4 + 80m^3 + 8m^2 = 0$

7. $98n^2 - 200 = 0$

8. $81v^4 - 900v^2 = 0$

Solving Quadratic Equations with Square Roots

Solve each equation by taking square roots.

https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratic-functions-equations/x2f8bb11595b61c86:untitled-1082/v/simple-quadratic-equation

1. $a^2 = 4$

2. $2m^2 + 10 = 210$

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

4. $16n^2 = 49$

5. $n^2 + 8 = 80$

Completing the Square

Find the value of c that completes the square.

https://www.khanacademy.org/math/algebra/quadratics/solving-quadratics-by-completing-the-square/v/solving-quadratic-equations-by-completing-the-square

1. $x^2 - 38x + c$

2. $x^2 + 7x + c$

Solve Quadratic Equations by Completing the Square

Solve each equation by completing the square.

https://www.khanacademy.org/math/algebra/quadratics/solving-quadratics-by-completing-the-square/v/solving-quadratic-equations-by-completing-the-square

1. $x^2 - 8x + 21 = 6$

2. $x^2 + 7x - 45 = 7$

Solving Quadratic Equations Using the Quadratic Formula

Solve each equation with the quadratic formula.
https://www.khanacademy.org/math/algebra/quadratics/solving-quadratics-using-the-quadraticformula/v/quadratic-formula-1

2. $4b^2 + 8b + 7 = 42$

3. $m^2 - 7m - 13 = -10$

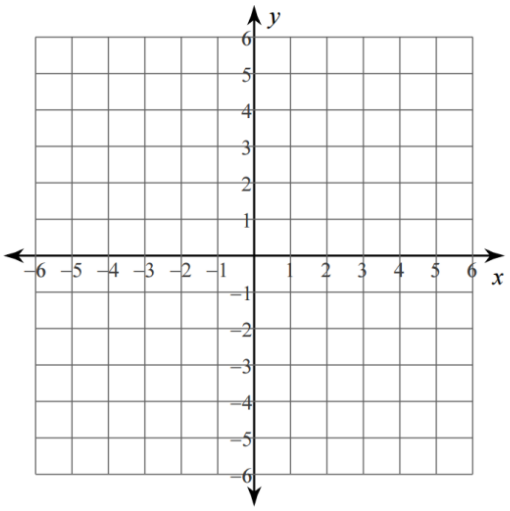
Graphing Quadratic Functions

Sketch the graph of each function.

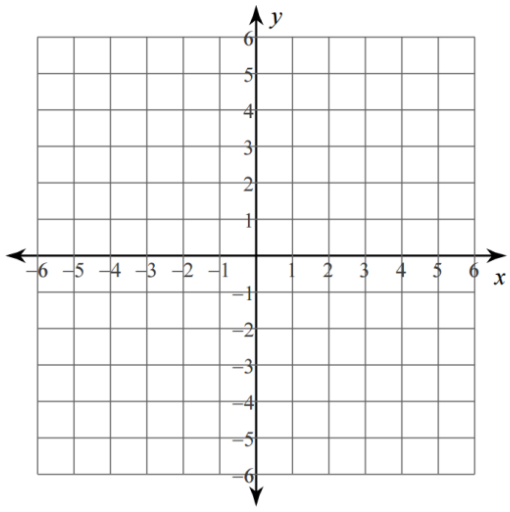
https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratic-functions-equations/x2f8bb11595b61c86:standard-form-quadratic/v/graphing-a-parabola-using-roots-and-vertex

Graph the functions in standard form

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



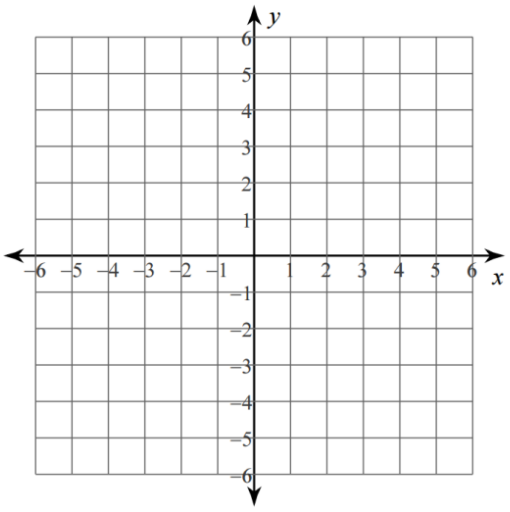
2. $f(x) = -x^2 + 2x + 1$



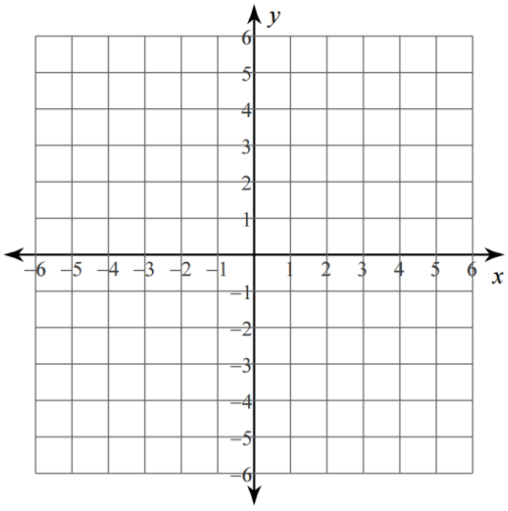
https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratic-functions-equations/x2f8bb11595b61c86:vertex-form/v/graphing-a-parabola-in-vertex-form

Graph the functions in vertex form.

3. $f(x) = (x-3)^2 + 2$



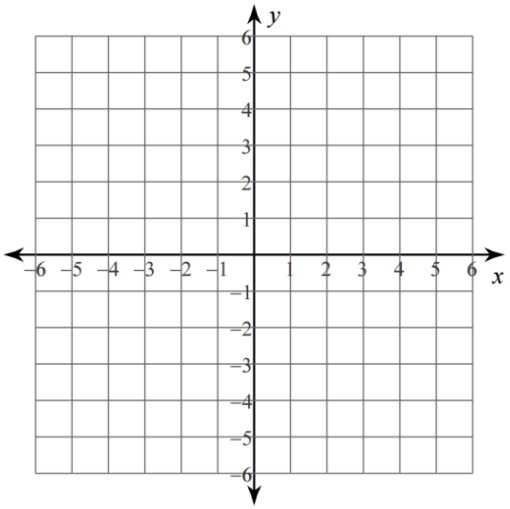
4. $f(x) = -(x+4)^2 - 1$



https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratic-functions-equations/x2f8bb11595b61c86:factored-form-quadratics/v/graphing-quadratics-in-factored-form

Graph the functions in intercept form.

5. $f(x) = (x - 5)(x + 3)$



6. $f(x) = 2(x + 4)(x + 2)$