

Algebra 2 Review—Chapters 1 and 2

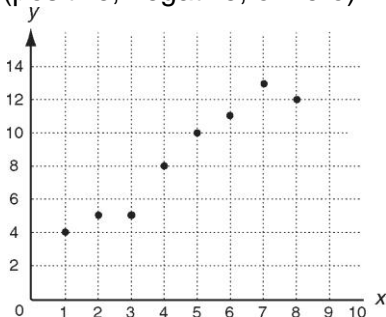
1. Given the point (6, -2). Perform each transformation and write the coordinates of the resulting point.

- translation right 5 units and up 4 units
- reflection across the y-axis
- reflection across the x-axis

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

- identify the parent function
- describe the transformations made to the parent function to obtain $f(x) = 3(x + 2)^3 - 1$

3. What type of correlation is shown? (positive, negative, or zero)



4. If the parent function $f(x) = x^2$ is vertically compressed by a factor of $\frac{1}{2}$,

translated 11 units to the left, then translated 5 units up, write the resulting function $g(x)$ in vertex form.

5. Given the parabola $f(x) = 2x^2 - 4x + 5$. Identify vertex, axis of symmetry, maximum or minimum, and the y-intercept.

6. Given the parabola $g(x) = \frac{-1}{4}(x - 3)(x + 5)$.

Identify vertex, axis of symmetry, x-intercepts, y-intercept, and maximum or minimum.

7. Given the parabola $h(x) = 4(x + 5)^2 + 7$.

Identify vertex, axis of symmetry, maximum or minimum, and the y-intercept.

8. Use completing the square to rewrite $f(x) = x^2 + 12x + 23$ in vertex form.

9. Solve for x by completing the square.

$$2x^2 - 4x - 34 = 0$$

10. Solve for x using quadratic formula:

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

11. Solve for x : $12x^2 - x - 6 = 0$

12. Solve for x : $\frac{2}{3}x^2 = -60$

13. Without solving, give the number and type of solutions for each quadratic equation:

a) $3x^2 - 5x + 8 = 0$

b) $9x^2 + 30x + 25 = 0$

14. Solve using algebra: $3x^2 - 16x + 5 < 0$

15. Simplify. Give answers in $a + bi$ as needed.

a) $\sqrt{-20} \cdot \sqrt{-3}$ b) $(7 + 5i) - 3(2 - 3i)$

c) $(2 + 7i)(-3 - 5i)$ d) $(7 + 3i)(7 - 3i)$

e) $\frac{5 - 3i}{4 + 2i}$

16. A circus performer throws a ball from a height of 32 feet. The function $h(t) = -16t^2 + 16t + 32$ gives the height of the ball in feet t seconds after it is thrown.

- a) What is the maximum height that the ball reaches?
b) After how many seconds will the ball hit the ground?

Answers:

1. a) (11, 2) b) (-6, -2) c) (6, 2)

2. a) $f(x) = x^3$
b) vertical stretch by a factor of 3, translation left 2 units, translation down 1 unit

3. positive

4. $g(x) = \frac{1}{2}(x+11)^2 + 5$

5. vertex (1, 3), axis of symmetry $x = 1$, minimum 3, y-intercept (0, 5)

6. vertex (-1, 4), axis of symmetry $x = -1$, x-intercepts (3, 0) and (-5, 0), y-intercept (0, 3.75), maximum 4

7. vertex (-5, 7), axis of symmetry $x = -5$, minimum 7, y-intercept (0, 107)

8. $f(x) = (x+6)^2 - 13$

9. $-1 \pm 3\sqrt{2}$

10. $\frac{-1 \pm \sqrt{22}}{3}$

11. $\frac{-4}{3}, 3$

12. $\pm 3i\sqrt{10}$

13. a) 2 complex (nonreal) solutions
b) 1 real solution

14. $\frac{1}{3} < x < 5$

15. a) $-2\sqrt{15}$
b) $1 + 14i$
c) $29 - 31i$
d) 58
e) $\frac{7}{10} - \frac{11}{10}i$

16. a) 36 feet b) 2 seconds