1.7 Completing the Square - Worksheet 1

I. Rewrite each quadratic function in vertex form.

1. $y = x^2 - 8x + 19$
2. $f(x) = x^2 + 12x + 37$
3. $y = x^2 - 3x + 4$

4. $y = 5x^2 + 10x + 7$
5. $g(x) = -4x^2 + 20x - 1$

II. Rewrite each quadratic function in vertex form. Then sketch the graph and state the domain and range in interval notation.

6. $y = -2x^2 + 16x - 29$
7. $f(x) = x^2 + 4x + 6$
8. $y = -x^2 + 6x - 7$

9. $y = 3x^2 - 6x + 3$

III. Solve.

10. $x^2 - 5x - 24 = 0$
11. $\dfrac{x^2}{4} - 15 = 0$
12. $12x^2 - 4x = 5$
13. $3x^2 + 20 = 0$
14. $5x^2 - 15x = 0$

15. $4x^2 - 144 = 0$
16. $-3x^2 - 10x + 8 = 0$
17. $x^2 + 4x - 45 = 0$
18. $5(2x - 3)^2 + 4 = -56$

IV. Find the zeros.

19. $y = \dfrac{1}{2}(x - 5)^2 - 100$

20. $y = 18x^2 + 51x + 8$

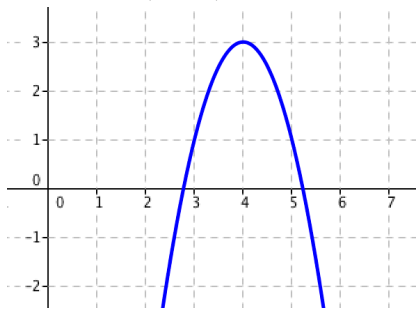## ANSWERS

1. $y = (x-4)^2 + 3$

2. $f(x) = (x+6)^2 + 1$

3. $y = \left(x - \dfrac{3}{2}\right)^2 + \dfrac{7}{4}$

4. $y = 5(x+1)^2 + 2$

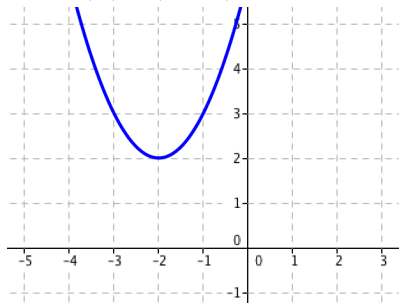5. $g(x) = -4\left(x - \dfrac{5}{2}\right)^2 + 24$

6. $y = -2(x-4)^2 + 3$

D: $(-\infty, \infty)$
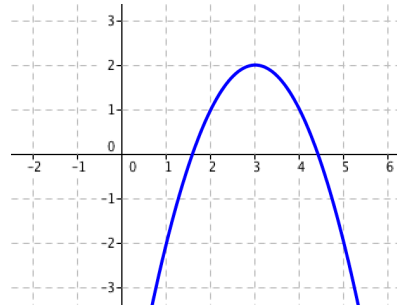
R: $(-\infty, 3]$

7. $f(x) = (x+2)^2 + 2$

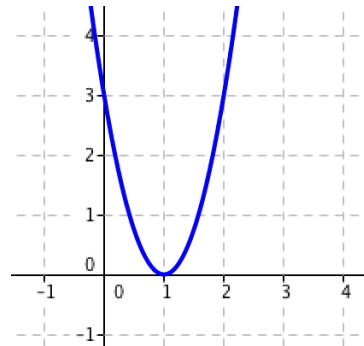D: $(-\infty, \infty)$

R: $[2, \infty)$

8. $y = -(x-3)^2 + 2$

D: $(-\infty, \infty)$

R: $(-\infty, 2]$

9. $y = 3(x-1)^2$

D: $(-\infty, \infty)$

R: $[0, \infty)$

10. $x = 8, -3$

11. $x = \pm 2\sqrt{15}$

12. $x = -\dfrac{1}{2}, \dfrac{5}{6}$

13. $x = \pm \dfrac{2i\sqrt{15}}{3}$

14. $x = 0, 3$

15. $x = \pm 6$

16. $x = \dfrac{2}{3}, -4$

17. $x = 5, -9$

18. $x = \dfrac{3}{2} \pm i\sqrt{3}$

19. $\left(5 + 10\sqrt{2}, 0\right), \left(5 - 10\sqrt{2}, 0\right)$

20. $\left(-\dfrac{1}{6}, 0\right), \left(-\dfrac{8}{3}, 0\right)$