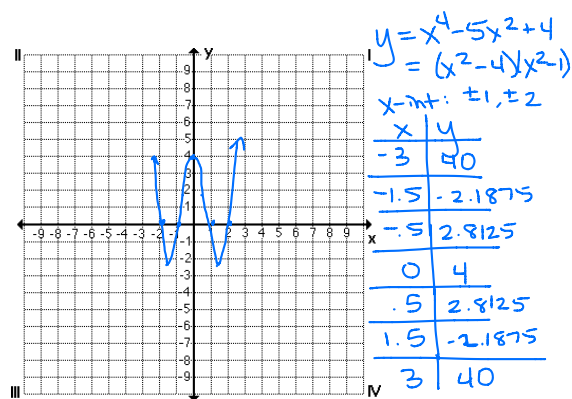Algebra 2 Unit 4 Review Key

KEY:

1. -11

2. $7s^3 - 2s^2 + 8s + 10$

3. $4t^3 - 4t^2 + 9t - 8$

4. $24x^3 - 22x^2 - 5x + 6$

5. $-x^4 + 12x^3 - 34x^2 + 4x + 3$

6. $7x + 11 - \dfrac{6}{x^2+1}$

7. $x^2 - 3x + 5 - \dfrac{1}{x+3}$

8. $3y^3(y-4)(y+4)$

9. $(3m+1)(9m^2 - 3m + 1)$

10. $(x^2 - 3)(3x^2 + 8)$

11. $-4b(b+5)(b^2 - 5b + 25)$

12. $(z-2)(z+2)(z-3)(z^2+4)$

13. $c^2(3c+10)(6c-1)$

14. $0, \pm\sqrt{21}$

15. $0, \pm 1, \pm 3$

16. $\pm 1, \pm 2, \pm 3, \pm 6, \pm 7, \pm 14, \pm 21, \pm 42,$
    $\pm\dfrac{1}{3}, \pm\dfrac{2}{3}, \pm\dfrac{7}{3}, \pm\dfrac{14}{3}$

17. $-\dfrac{7}{2}, -1, 2$

18. $\pm 1, \pm 4i$

19. $f(x) = x^3 - 2x^2 - 5x + 6$

20. $f(x) = x^3 + 4x^2 - 7x - 10$

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

22.

$y = x^4 - 5x^2 + 4$
$= (x^2 - 4)(x^2 - 1)$
x-int: $\pm 1, \pm 2$

x	y
-3	40
-1.5	-2.1875
-.5	2.8125
0	4
.5	2.8125
1.5	-2.1875
3	40

End Behavior: $x \to \infty, y \to \infty$
$x \to -\infty, y \to \infty$

Domain: $\mathbb{R}$
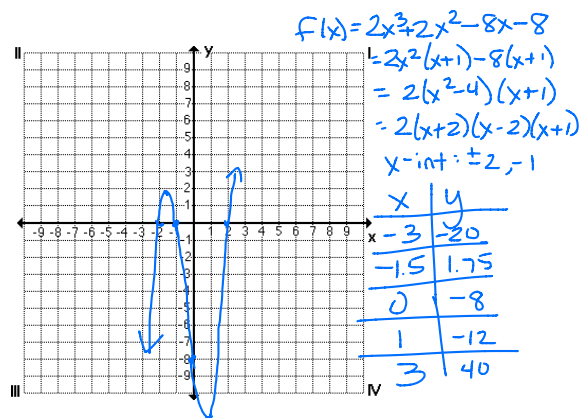
Range: $[-2.25, \infty)$

x-intercept: $\pm 1, \pm 2$

y-intercept: 4

Local Max: $(0, 4)$

Local Min: $(-1.58, -2.25) \approx (-1.5, -2.1875)$
$(1.58, -2.25) \approx (1.5, -2.1875)$

23.

$f(x) = 2x^3 + 2x^2 - 8x - 8$
$= 2x^2(x+1) - 8(x+1)$
$= 2(x^2 - 4)(x+1)$
$= 2(x+2)(x-2)(x+1)$
x-int: $\pm 2, -1$

x	y
-3	-20
-1.5	1.75
0	-8
1	-12
3	40

End Behavior: $x \to \infty, f(x) \to \infty$
$x \to -\infty, f(x) \to -\infty$

Domain: $\mathbb{R}$

Range: $\mathbb{R}$

x-intercept: $\pm 2, 1$

y-intercept: -8

Local Max: $(-1.53, 1.76) \approx (-1.5, 1.75)$

Local Min: $(.87, -12.13) \approx (1, -12)$