Name: ___Solution Key___

1. [**3 points**] Simplify $\dfrac{2x + b - 3}{x - 4} - \dfrac{x + 5}{3x}$.

$$\frac{(2x+b-3)\,3x}{(x-4)\,3x} - \frac{(x+5)(x-4)}{3x(x-4)}$$

$$= \frac{6x^2 + 3bx - 9x}{3x^2 - 12x} - \frac{x^2 + x - 20}{3x^2 - 12x}$$

$$= \frac{6x^2 + 3bx - 9x - x^2 - x + 20}{3x^2 - 12x}$$

$$= \boxed{\frac{5x^2 + 3bx - 10x + 20}{3x^2 - 12x}}$$

2. [**2 points**] Simplify $\dfrac{5x^{3/2}}{x} + \sqrt{x}$.

$$5x^{1/2} + x^{1/2}$$

$$= \boxed{6x^{1/2}}$$

$$= \boxed{6\sqrt{x}}$$

3. [**2 points**] Find all solutions to the equation $x^2 + 6x - 40 = 0$.

$$(x - 4)(x + 10) = 0$$

$$\boxed{x = +4 \quad \text{or} \quad x = -10}$$

4. [**3 points**] Find all solutions to the equation $6 = t + \sqrt{76 - 15t}$.

$$6 - t = \sqrt{76 - 15t}$$

$$(6 - t)^2 = 76 - 15t$$

$$36 - 12t + t^2 = 76 - 15t$$

$$t^2 + 3t - 40 = 0$$

$$(t + 8)(t - 5) = 0$$

$$t = -8 \quad \text{or} \quad t = 5.$$

Check: $t = -8$: $6 - (-8) = \sqrt{76 - 15(-8)}$

$$14 = \sqrt{76 + 120}$$

$$14 = \sqrt{196} \quad \checkmark$$

$t = 5$: $6 - 5 = \sqrt{76 - 15 \cdot 5}$

$$1 = \sqrt{1} \quad \checkmark$$

Both $t = -8$ and $t = 5$ are solns

5. Have you taken a calculus class before?   Yes

6. If you could have dinner with any person dead or alive, who would it be, and why?

Paul Erdős, to work on reducing my "Erdős" number