NAME: _____ PERIOD: _____ DATE: _____

Homework Problem Set

Examine the two equations below and *decide* what is the most efficient way to solve each one.

1. $4x^2 + 5x + 3 = 2x^2 - 3x$

$2x^2+8x+3=0$

$a=2 \quad b=8 \quad c=3$

$x=\frac{-8\pm\sqrt{(8)^2-4(2)(3)}}{2(2)}$

$=\frac{-8\pm\sqrt{64-24}}{4}=\frac{-8\pm\sqrt{40}}{4}$

$=\frac{-4\pm 2\sqrt{10}}{2}=\boxed{\frac{-4\pm\sqrt{10}}{2} \text{ or } -2\pm\frac{\sqrt{10}}{2}}$

2. $x^2 - 14 = 5x$

FACTORING

$x^2-5x-14=0$

$(x-7)(x+2)=0$

$\boxed{x=7,-2}$

-14
-7 2
-5

3. Solve each equation with the most efficient method.

4. What are the differences between these two quadratic equations? Is one easier to solve than the other? Explain your thinking.

Answers may vary

Both equations need to be set = to 0 before solving

5. Is one pathway to the solution *more correct* than another?

There are many ways to solve/find x-intercepts. Some methods are more efficient than others.

Solve each quadratic equation using the quadratic formula.

6. $x^2 + 2x - 8 = 0$

$$x = \frac{-2 \pm \sqrt{2^2 - 4 \cdot 1 \cdot (-8)}}{2 \cdot 1}$$

$$x = -\frac{2 \pm \sqrt{36}}{2}$$

$$x = -\frac{2 \pm 6}{2} = -1 \pm 3$$

$x = -4 ; x = 2$

7. $d^2 + 5d - 6 = 0$

$$d = -\frac{5 \pm \sqrt{5^2 - 4 \cdot 1 \cdot (-6)}}{2 \cdot 1}$$

$$d = \frac{-5 \pm \sqrt{49}}{2}$$

$$d = -\frac{5 \pm 7}{2}$$

$$d = \frac{-5 + 7}{2} = 1$$

$$d = \frac{-5 - 7}{2} = -6$$

$d = 1 ; d = 6$

8. $2k^2 - 5k + 3 = 0$

$$k = \frac{5 \pm \sqrt{(-5)^2 - 4 \cdot 2 \cdot 3}}{2 \cdot 2}$$

$$k = \frac{5 \pm \sqrt{1}}{4}$$

$$k = \frac{5 \pm 1}{4}$$

$$k = \frac{5+1}{4} = \frac{3}{2}$$

$$k = \frac{5-1}{4} = 1$$

$k = \frac{3}{2} ; k = 1$

9. $2a^2 - a - 13 = 2$

$$a = \frac{1 \pm \sqrt{121}}{4}$$

$$a = \frac{1 \pm 11}{4}$$

$$a = \frac{1+11}{4} = 3$$

$$a = \frac{1-11}{4} = -\frac{5}{2}$$

$a = 3 ; a = -\frac{5}{2}$

10. $8x^2 - 4x - 5 = 0$

$$x = \frac{4 \pm \sqrt{9-4)\text{^}2 - 4 \cdot 8 \cdot (-5)}}{2 \cdot 8}$$

$$x = \frac{4 \pm \sqrt{176}}{16}$$

$$x = \frac{4 \pm 4\sqrt{11}}{16}$$

$x = \frac{1 \pm \sqrt{11}}{4}$

11. $8m^2 + 6m = -5$

$$8m^2 + 6m + 5 = 0$$

$$m = -\frac{6 \pm \sqrt{6^2 - 4 \cdot 8 \cdot 5}}{2 \cdot 8}$$

$$m = \frac{-6 \pm \sqrt{-124}}{16}$$

no real solution

12. $10n^2 - n + 9 = 0$

$$n = \frac{1 \pm \sqrt{(-1)^2 - 4 \cdot 10 \cdot 9}}{2 \cdot 10}$$
$$n = \frac{1 \pm \sqrt{-359}}{20}$$
No real solutions

13. $x^2 = -3x + 40$

$$x^2 + 3x - 4 = 0$$
$$x = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot (-40)}}{2 \cdot 1}$$
$$x = \frac{-3 \pm \sqrt{169}}{2} = \frac{-3 \pm 13}{2}$$
$$x = \frac{-3 + 13}{2} = 5$$
$$x = \frac{-3 - 13}{2} = -8$$
$x = 5 ; x = 8$

14. $3f^2 = 6f - 3$

$$3f^2 - 6f + 3 = 0$$
$$f = \frac{6 \pm \sqrt{(-6)^2 - 4 \cdot 3 \cdot 3}}{2 \cdot 3}$$
$$f = \frac{6 \pm \sqrt{0}}{6}$$
$f = 1$

15. $3p^2 - 18 = 0$

$$p = \frac{0 \pm \sqrt{0^2 - 4 \cdot 3 \cdot (-18)}}{2 \cdot 3}$$
$$p = \frac{\pm\sqrt{216}}{6} = \frac{\pm 6\sqrt{6}}{6} = \pm\sqrt{6}$$

16. $w^2 + 7w + 8 = 0$

$$w = \frac{-7 \pm \sqrt{7^2 - 4 \cdot 1 \cdot 8}}{2 \cdot 1}$$
$$w = \frac{-7 \pm \sqrt{17}}{2}$$

17. $q^2 = 25$

$$q^2 - 25 = 0$$
$$q = \frac{0 \pm \sqrt{0^2 - 4 \cdot 1 \cdot (-25}}{2 \cdot 1}$$
$$q = \frac{\pm\sqrt{100}}{2} = \frac{\pm 10}{2}$$
$q = 5 ; q = -5$