homework help

Pick up the

WARM UP!

1. Powell was trying to solve the quadratic equation $x^2 + 2.5x - 1.5 = 0$. "*I think I need to use the Quadratic Formula because of the decimals,*" she told Walter. Walter replied, "*I'm sure there's another way! Can't we rewrite this equation so there aren't any decimals?*"

What is Walter talking about? Rewrite the equation so that it has no decimals. You don't need to solve it !

$$x^2 + 2.5x - 1.5 = 0$$

$$10x^2 + 25x - 15 = 0$$

$$2x^2 + 5x - 3 = 0$$

2. Re-write the following three equations (or system), but do **not** solve them.

a. $100x^2 + 100x = 2000$

$\frac{}{100} \quad \frac{}{100} \quad \frac{}{100}$

$x^2 + x = 20$

b. $15x + 10y = -20$
$7x - 2y = 24$

$\rightarrow \quad 3x + 2y = -4$
$7x - 2y = 24$

c. $\frac{1}{3}x^2 + \frac{x}{2} - \frac{1}{3} = 0$

$6 \cdot \frac{1}{3}x^2 + 6 \cdot \frac{x}{2} - 6 \cdot \frac{1}{3} = 0 \cdot 6$

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

$6(\quad)\ 6(\quad)\ 6(\quad)\ 6(\quad)$

Consider each of the following equations and systems. Would substitution make them easier to solve? What expression might you temporarily replace with U?

$U = m^2 + 5m - 24$

You do not need to actually solve the equation(s).

a. $(m^2 + 5m - 24)^2 - (m^2 + 5m - 24) = 6$

$U^2 - U = 6$

$U^2 - U - 6 = 0$

$U = 3 \quad U = -2$

$m^2 + 5m - 24 = 3 \qquad m^2 + 5m - 24 = -2$

$(4x^2 + 4x - 3)^2 = (x^2 - 5x - 6)^2$

?

a) $5x - 2y = 8$

$-5x \qquad -5x$

$\frac{-2y}{-2} = \frac{8}{-2} - \frac{5x}{-2}$

$y = -4 + \frac{5}{2}x$

$y = \frac{8-5x}{-2}$

b) $\frac{xy}{x} + \frac{3x}{x} = \frac{2}{x}$

$y + 3 = \frac{2}{x}$

$y = \frac{2}{x} - 3$

HW

$\boxed{25}$ JENNA

$2000x - 4000 = 8000$

$\overline{1000} \quad \overline{1000} \quad \overline{1000}$

$2x - 4 = 8$

(c) $\frac{3}{50} - \frac{x}{50} = \frac{7}{50}$

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$\boxed{32}$ $(x^3 y^{-2})^{-4}$

(a)

$(x^3)^{-4} (y^{-2})^{-4}$

$x^{-12} \cdot y^{8}$

$= \dfrac{y^8}{x^{12}}$

(b) $-3x^2 (6xy - 2x^3y^2z)$

$-3x^2 \cdot 6xy + 3x^2 \cdot 2x^3y^2z$

$-18x^3y + 6x^5y^2z$

35 (a) circle radius 12 center $(-2,13)$ $x^2+y^2=r^2$

(b) center $(-1,-4)$ radius 1

The strategy used in the warm up can be described as:

Solving by re-writing

NOTES

Solving equations by re-writing

given a sitation → rewrite → solve

Example 1

$$(x)(x-1)\left(\frac{x-3}{x}\right) + (x)\frac{2}{x-1}(x-1) = \left(\frac{5-x}{x}\right)(x-1)(x)$$

multiply by x and x-1

$$(x-1)(x-3) + 2x = (5-x)(x-1)$$

$$x^2-3x-x+3+2x = 5x-5-x^2+x$$

$$x^2-2x+3 = -x^2+6x-5$$

$$2x^2-2x+3 = 6x-5$$

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

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

$a=1$
$b=-4$
$c=4$

$$x = \frac{-(-4)\sqrt{(-4)^2-4(1)(4)}}{2(1)} = \frac{4\pm\sqrt{0}}{2} = \frac{4}{2}$$

$x=2$

Example 2 - Rewrite to a familiar form

$x^2 + y^2 + 10x + 8y = 8$

$x^2 + 10x + 25 + y^2 + 8y + 16 = 8 + 25 + 16$

$(x+5)^2 + (y+4)^2 = 49$

$\left(\frac{10}{2}\right)^2$

25

$r = 7$

center $(-5, -4)$

Last thing of the day

a) Are the functions equivalent?

$y = (x-3)(x-5)$ $y = 2(x-3)(x-5)$

Do they have the same roots?

b) Find roots

$0 = (x-3)(x-5)$ $0 = 2(x-3)(x-5)$

ZPP ZPP

$(x-3)=0$ $(x-5)=0$ $x-3=0$ $x-5=0$

$x=3$ $x=5$ $x=3$ $x=5$

both have Same roots

ROOTS

1. A root is a value that, as an input, makes a function turn to 0
2. A value of a root is the same as its x-intercept(s)
3. Functions that have the same roots are not necessarily equilvant.

B.B.

Assignment :

3 ...... 45-46 , 49-50, 53-54

Optional just for fun challenge → Solve the system :

$$\frac{\sqrt{x^2-15x}}{2y}=5$$
$$3\sqrt{x^2-15x}-3y=27$$

bring me your answer tomorrow and I'll check it.

SO , now the infamous #6

f. $$\frac{\sqrt{x^2-15x}}{2y}=5$$
$$3\sqrt{x^2-15x}-3y=27$$

Question # 39 deals with the infamous problem

$$\begin{aligned} 2y\cdot\frac{\sqrt{x^2-15x}}{2y} &= 2y\cdot 5 \\ \frac{3\sqrt{x^2-15x}-3y}{3} &= \frac{27}{3} \end{aligned} \Rightarrow \begin{aligned} \sqrt{x^2-15x} &= 10y \\ \sqrt{x^2-15x}-y &= 9 \end{aligned} \Rightarrow \begin{aligned} y &= \frac{\sqrt{x^2-15x}}{10} \\ y &= \sqrt{x^2-15x}-9 \end{aligned}$$

$$\begin{aligned} 2y\cdot\frac{\sqrt{x^2-15x}}{2y} &= 2y\cdot 5 \\ \frac{3\sqrt{x^2-15x}-3y}{3} &= \frac{27}{3} \end{aligned} \Rightarrow \begin{aligned} \sqrt{x^2-15x} &= 10y \\ \sqrt{x^2-15x}-y &= 9 \end{aligned} \Rightarrow \boxed{\begin{aligned} y &= \frac{\sqrt{x^2-15x}}{10} \\ y &= \sqrt{x^2-15x}-9 \end{aligned}}$$

Graciela and Walter realized they had a big mess to try to solve. "*Wait*," Graciela said. "*There's an easier way. Let's use substitution to make this system simpler!*"

do parts b $\rightarrow$ d

$$\frac{\sqrt{x^2-15x}}{10} = \sqrt{x^2-15x} - 9$$

$$y = \frac{\sqrt{x^2-15x}}{10}$$
$$y = \sqrt{x^2-15x} - 9$$