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 !

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

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

$.5(2x^2 + 5x - 3) = 0$

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

$x^2 + \frac{5}{2}x - \frac{3}{2} = 0$

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

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

$x^2 + x = 20$

$x^2 + x - 20 = 0$

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

5

$15x + 10y = -20$
$35x - 10y = 120$

$22x + 8y = 4$

$y =$

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

$6\left(\frac{1}{3}x^2\right) + \cancel{6}^{3}\left(\frac{x}{\cancel{2}_1}\right) - 6\left(\frac{1}{3}\right) = 6(0)$

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

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

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) $5x - 2y = 8$

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

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

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

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

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

HW

$\boxed{25}$ JENNA

$$2000x - 4000 = 8000$$

$$\frac{2000x}{1000} - \frac{4000}{1000} = \frac{8000}{1000}$$

$$2x - 4 = 8$$

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

31

29 c $f(x) = 2x+1$ $g(x) = x-3$

$f(x) \bullet g(x)$

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

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

(a)

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

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

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

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

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

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

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 by re-writing

given a sitation → rewrite → solve

Example 1

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

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

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

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

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

$$2x^2-8x+3 = -5$$

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

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

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

$x - 2 = 0$

$x = 2$

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

$(2x-4)(x-2) = 0$

$2x - 4 = 0$

$2x = 4$

$x = 2$

Example 2 - Rewrite to a familiar form

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

circle

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

$(x+5)(x+5) \quad (y+4)(y+4)$

y^2	$4y$
$4y$	

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

$r = 7 \quad (-5, -4)$ center

B.B.

Last
thing
of the day

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

Do they have the same roots?

roots: inputs (x-values) that make the function calculate to zero.

the functions are not equivalent but they have the same roots

$x=3$ and $x=5$

b

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

Assignment :

3 ...... 35c, 41b, 45-46 , 49-50, 53-54

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

$$2y \cdot \frac{\sqrt{x^2-15x}}{2y} = 2y \cdot 5 \quad \Rightarrow \quad \sqrt{x^2-15x} = 10y \quad \Rightarrow \quad y = \frac{\sqrt{x^2-15x}}{10}$$

$$\frac{3\sqrt{x^2-15x}-3y}{3} = \frac{27}{3} \quad \Rightarrow \quad \sqrt{x^2-15x} - y = 9 \quad \Rightarrow \quad y = \sqrt{x^2-15x} - 9$$

$$2y \cdot \frac{\sqrt{x^2-15x}}{2y} = 2y \cdot 5 \quad \Rightarrow \quad \sqrt{x^2-15x} = 10y \quad \Rightarrow \quad y = \frac{\sqrt{x^2-15x}}{10}$$

$$\frac{3\sqrt{x^2-15x}-3y}{3} = \frac{27}{3} \quad \Rightarrow \quad \sqrt{x^2-15x} - y = 9 \quad \Rightarrow \quad y = \sqrt{x^2-15x} - 9$$

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 → d

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

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

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