WARM UP!

homework help

Powell was trying to solve the quadratic equation

1. $x^2 + 2.5x - 1.5 = 0$. "*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 !

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

$\times 10$

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

$\times 2$

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

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

a. $\frac{100x^2}{100} + \frac{100x}{100} = \frac{200\cancel{0}}{10\cancel{0}}$

$x^2 + x = 20$

$x^2 + x - 20 = 0$

$a = 1$
$b = 1$
$c = -20$

$0 = -x^2 - x + 20$

$a = -1$
$b = -1$
$c = 20$

b. $15x + 10y = -20$ $\longrightarrow$ $15x + 10y = -20$
$7x - 2y = 24$ $\xrightarrow[\times 5]{}$ $+\ 35x - 10y = 120$

b. $15x + 10y = -20$ $\xrightarrow{\div 5}$ $3x + 2y = -4$
$7x - 2y = 24$ $\longrightarrow$ $+\ 7x - 2y = 24$

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

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

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

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

easier to solve? What expression might you temporarily replace with U?

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

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

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

$U^2 - U = 6$

$U^2 - U - 6 = 0$

$x^2 - x - 6 = 0$

$(x + \cancel{4}2)(x - 3) = 0$

$U = 3 \quad U = -2$

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

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

?

$W^2 = U^2$

a) $5x - 2y = 8$

$-5x \quad -5x$

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

$xy = 2 - 3x$

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

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

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

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

32

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

(a)

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

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

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

(b)

$$-3x^2\left(6xy - 2x^3y^2z\right)$$

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

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

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 by re-writing

given a sitation → rewrite → solve

Example 1

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

multiply by $(x-1)$

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

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

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

$$+x^2 \quad -6x \quad +5 \qquad +x^2 \quad -6x \quad +5$$

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

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

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

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

$$x-2=0$$

$$x=2$$

Especially with equations that have variables in the denominator, check your answers.

Example 2 - Rewrite to a familiar form

$x^2 + y^2 + 10x + 8y = 8$ ← circle

Convert to a circle in standard form by completing the square twice!

$\left(\frac{8}{2}\right)^2 = 16$

get x's together get y's together

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

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

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

circle with center $(-5, -4)$ and radius $r = 7$

B.B.

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?

roots are values that produce a funtion value of zero.

b

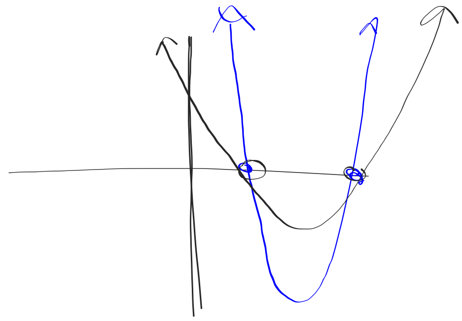
$0 = (x-3)(x-5)$

$x-3=0$ $x-5=0$

$x=3$ $x=5$

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

$x=3$ $x=5$



Assignment:

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