

Pick up Warm Up



While you work, let me know if there are HW questions you want me to go over.

Area models can help rewrite expressions that involve multiplication?

The area model at right relates the expressions $(2x - 3)(3x + 1)$ and $6x^2 - 7x - 3$.

+ 1	2x	-3
3x	6x ²	-9x
	2x	-3

- a) Use an area model to find an expression equivalent to $(5k - 3)(2k - 1)$

	2k	-1
5k		
-3		

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- a) Use an area model to find an expression equivalent to $(5k - 3)(2k - 1)$

$$10k^2 - 11k + 3$$

	2k	-1
5k	10k ²	-5k
-3	-6k	3

- b) Use an area model to help you multiply $(p^2 + 3p + 9)(2p - 1)$

	2p	-1
p ²		
3p		
9		

	2p	-1
p ²	2p ³	-p ²
3p	6p ²	-3p
9	18p	-9

$$2p^3 + 5p^2 + 15p - 9$$

- c) Write the last problem as a product being equal to the sum

$$(p^2 + 3p + 9)(2p - 1) = 2p^3 + 5p^2 + 15p - 9$$

d) Write $2x^2+5x+2$ as a product (in other words.... factor it!)

$$= (x+2)(2x+1)$$

FACTORING QUADRATICS

that are

Differences of Perfect Squares

$$w^2 - 81 = \boxed{w}^2 - \boxed{9}^2 = (w+9)(w-9)$$

$$x^2 - 16y^2 = \boxed{x}^2 - \boxed{4y}^2 = (x+4y)(x-4y)$$

$$4m^2 - 1 = \boxed{2m}^2 - \boxed{1}^2 = (2m+1)(2m-1)$$

$$4a^2 + 9b^2 = \text{can't be factored}$$

HW

3-... 5 to 12

yesterday

$$2x + 5y = 1 \qquad 3x - 7y = 2$$

$$2\left(\frac{2+7y}{3}\right) + 5y = 1$$

$$2(2+7y) + 15y = 3$$

$$4 + 14y + 15y = 3$$

$$3x = 2 + 7y$$

$$x = \frac{2+7y}{3}$$

$$x = \frac{17}{29}$$

$$y = -\frac{1}{29}$$

$$12a \quad 25^{\frac{1}{2}} = \frac{1}{25^{\frac{1}{2}}} = \frac{1}{\sqrt{25}}$$

$$= \frac{1}{5}$$

7

$$\left(\frac{2x^5 y^4}{8xy^3} \right)^3$$

Bonnie

$$\frac{8x^{15} y^{12}}{512 x^3 y^9}$$

Dylan

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

$$\textcircled{5} \text{ a } (2x-3)^2 + 5$$

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

$$4x^2 - 6x - 6x + 9 + 5$$

$$\textcircled{b}$$

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



(a)

$$\sqrt{4x^2y^4}$$

(b)

$$\sqrt{8x^2y}$$

(c)

$$\sqrt{4x^2y}$$

(d)

$$\sqrt{16xy^2}$$

(e)

$$\sqrt{8xy^2}$$

8 Describe the graph given the equation

a) $y = 3$

b) $x = -2$

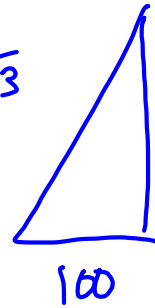
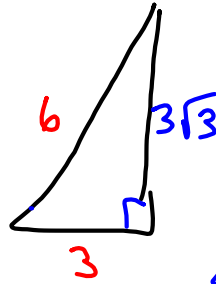
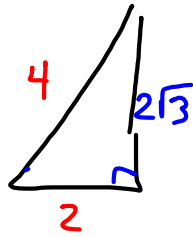
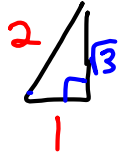
c) Where do
the graphs
cross

9

$$342 = 23m + b$$

$$147 = 10m + b$$

10



The long leg is ...

The hypotenuse is



3, 9, ...

(a) Arith

(b) Geom

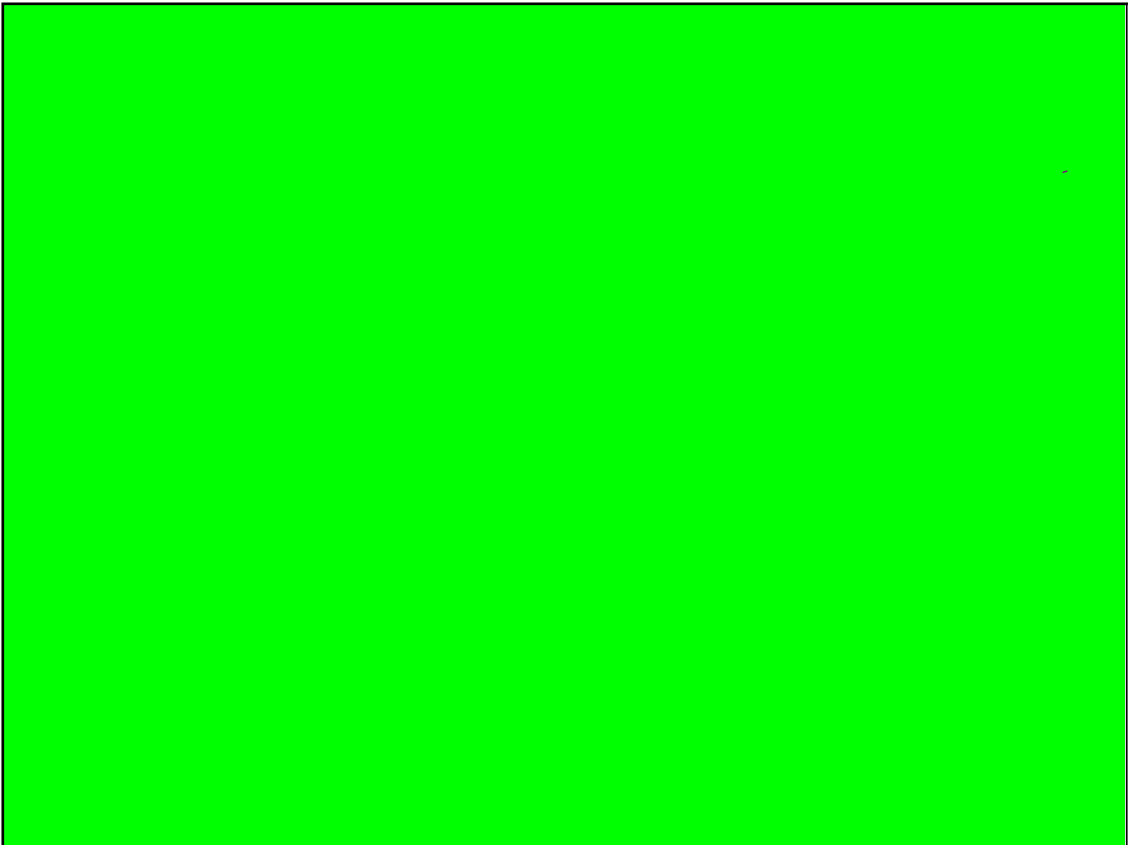
(c) Neither

2 a $25^{-\frac{1}{2}} =$

b $\left(\frac{1}{27}\right)^{-\frac{1}{3}} =$

c $9^{\frac{3}{2}} =$

d $16^{-\frac{3}{4}} =$



Continuing with

EQUIVALENT EXPRESSIONS

•
today's goal...

What are other ways to find equivalent expressions?

textbook $3-17$ b and c

For each, make two equivalent statements

(a)

x^2	
$8x$	

For each, make two equivalent statements

(b)

x	x^2	$3x$
8	$8x$	24
	x	3

$$(x+8)(x+3) = x^2 + 11x + 24$$

(c)

$5x$	$10x^2$	$-20xy$	$25x$
-3	$-6x$	$12y$	-15
	$2x$	$-4y$	5

-3		
	$-4y$	

$$(5x-3)(2x-4y+5)$$

$$= 10x^2 - 20xy + 12y + 19x - 15$$

The **U** substitution trick

Solve the system

$$\begin{aligned} 2x + y^7 &= 6 \\ 3x - 2y^7 &= -5 \end{aligned}$$

Substitute **U** for y^7

$$\begin{aligned} 2x + U &= 6 \\ 3x - 2U &= -5 \end{aligned}$$

$$\begin{aligned} 4x + 2U &= 12 \\ 3x - 2U &= -5 \end{aligned}$$

$$7x = 7$$

$$x = 1 \dots \dots$$

$$\begin{aligned} 2(1) + U &= 6 \\ U &= 4 \end{aligned}$$

Solution

$$x = 1$$

$$y = \sqrt[7]{4}$$

$$U \rightarrow y^7$$

$$y^7 = 4$$

$$\sqrt[7]{y^7} = \sqrt[7]{4}$$

$$y = \sqrt[7]{4}$$

FACTOR

$$(a+7)^2 - 10(a+7) + 25$$

Substitute **U** for $a+7$

$$U^2 - 10U + 25$$

$$(U-5)(U-5)$$

$$a+7 \rightarrow U$$

$$(a+7-5)(a+7-5) = (a+2)(a+2)$$

or $(a+2)^2$

U^2	$-5U$
$+5U$	$+25$

$$\begin{array}{l} 25U^2 \\ -10U \end{array} \quad \begin{array}{l} -25U \\ -5U \end{array}$$

In order to re-write $y^4 - x^2$

$$\square^2 - \square^2$$

substitute **U** for y^2

$$(U)^2 - x^2$$

$$(U+x)(U-x)$$

$$U \rightarrow y^2$$

$$(y^2+x)(y^2-x)$$

Re-write $9x^2y^4 - z^6$

$$U^2 - V^2$$

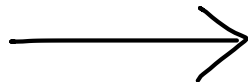
$$\boxed{3xy^2}^2 - \boxed{z^3}^2$$

substitute U for $3xy^2$

and V for z^3

$$(3xy^2 + z^3)(3xy^2 - z^3)$$

B.B.



CIRCLES

$$x^2 + y^2 = 16 \quad (x+5)^2 + (y+3)^2 = 17$$

$$r = 4$$

center $(0, 0)$

$$r = \sqrt{17}$$

center $(-5, -3)$

$$x^2 - 6x + 10y + y^2 - 15 = 3$$

$$r = ?$$

center ?

We need the help of a recent friend to convert to standard form

friend \rightarrow Completing the square

$$x^2 - 6x + 10y + y^2 - 15 = 3$$

$$x^2 - 6x + 9 \quad y^2 + 10y + 25 = 18 + 9 + 25$$

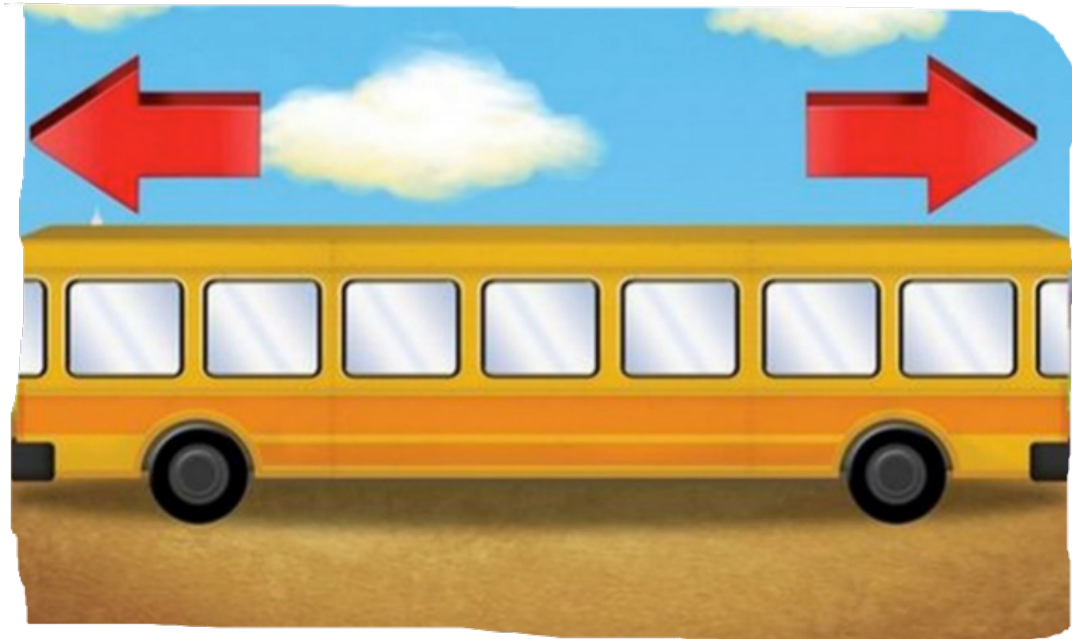
$$(x-3)(x-3) \quad (\quad)$$

$$\left(\frac{10}{2}\right)^2 = 25$$

$$\left(\frac{-6}{2}\right)^2 = 9$$

$$(x-3)^2 + (y+5)^2 = 52$$

$$\text{center } (3, -5) \quad r = \sqrt{52}$$



$$y^2 + 4x + 12y + 18 + \cancel{y}^2 = 32$$

$$x^2 + 4x + 4 + y^2 + 12y + 36 = 14 + 4 + 36$$

$$\left(\frac{4}{2}\right)^2 (x+2)^2 + (y+6)^2 = 54$$

$$= 4$$

$$r = \sqrt{54}$$

$$\left(\frac{12}{2}\right)^2 = 36$$

$$(-2, -6)$$

See your
test

Assignment

3 - 23ace , 25, 29c , 30, 31-32, 35