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Algebra Reviews / 1033 (2024 Fall) Final Knowledge Check Practice

$$\sqrt{3} \cdot \sqrt{27}$$

$$\sqrt{81}$$

$$9$$

$$3 \times 27 = 81$$

Inside $\times$ Inside
 Outside $\times$ Outside

$$E.g. \sqrt{25} \cdot \sqrt{36}$$

$$6\sqrt{30}$$

$$\sqrt{15x^8} \sqrt{3x}$$

$$\sqrt{45x^9}$$

$$3x^4\sqrt{5x}$$

$$\textcircled{x} \textcircled{x} \textcircled{x} \textcircled{x} \textcircled{x} \textcircled{x} \times$$

$$\frac{9}{2} = 4r1$$

$$\frac{3x^4 + 8x^3}{-x^2}$$

Three terms
 Pull out what's common
 all have at least 2 x's

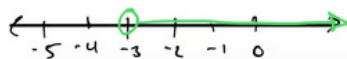
$$\frac{3x^2 + 8x}{-1}$$

take away x^2 from each

$$-3x^2 - 8x$$

Divide all by -1

$$b > -3$$



$<, >$ $\bigcirc$ open circle
 $\leq, \geq$ $\bullet$ closed circle

$$-x^4 + 4x^3 + 3x^2 + 8x + 12 \text{ divided by } (x-5)$$

$$x-5=0$$

$$x=5$$

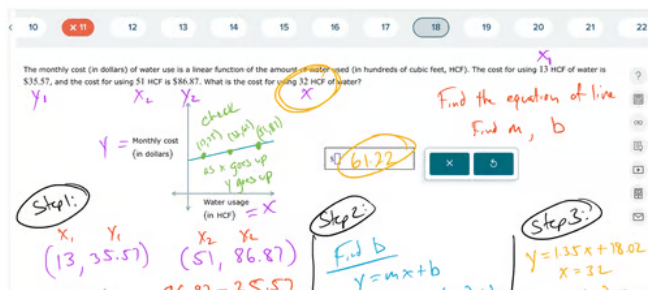
$$5 \overline{) -1 \ 4 \ 3 \ 8 \ 2} \quad (\text{coefficients})$$

$$\downarrow \text{ } 5 \times -1 = -5 \quad 5 \times 4 = 20 \quad 5 \times 3 = 15 \quad 5 \times 8 = 40 \quad 5 \times 2 = 10$$

$$\text{New coefficients } -1 \ -1 \ -2 \ -2 \ \underline{-8} \text{ remainder}$$

Since you started
 with x^4 and you
 divided one x out $(x-5)$
 start with x^3

$$\text{Answer: } -x^3 - x^2 - 2x - 2 + \frac{-8}{x-5}$$



$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 11}{51 - 13} = \frac{-11}{38} = -1.35$$

$$35.57 = 1.35(13) + b$$

$$35.57 = 17.55 + b$$

$$-17.55 = -17.55$$

$$18.02 = b$$

$$y = 1.35(13) + 18.02$$

$$y = 43.2 + 18.02$$

$$y = 61.22$$

Final Knowledge Check Practice
Question 15 of 43 (1 point) | Question Attempt: 1 of Unlimited

The graph of the relation G is shown below.

Give the domain and range of G .
Write your answers using set notation.

domain = $\{-1, 0, 3, 4\}$
range = $\{-4, 1, 3, 4\}$

Domain - 1st elements in ordered pair
(x, y) Domain = x
Range - 2nd elements in ordered pair
Range = y

(Bob, 75)
(Suzie, 63)
Domain: {Bob, Suzie}
Range: {75, 63}

Check

For his phone service, Ryan pays a monthly fee of \$17, and he pays an additional \$0.07 per minute of use. The least he has been charged in a month is \$97.22.

What are the possible number of minutes he has used his phone in a month?

Let m be the number of minutes and solve your inequality for m .

changing = slope
since we don't know how many minutes use M

$$17 + 0.07m \geq 97.22$$

Check

Final Knowledge Check Practice
Question 16 of 43 (1 point) | Question Attempt: 1 of Unlimited

Graph the solution to the following system of inequalities.

$$y > \frac{5}{4}x - 4$$

$$-5x + 4y \leq 4$$

Then give the coordinates of one point in the solution set.

Point in the solution set: (0, 0)

2 differences:
① $<, >$ dashed
 $\leq, \geq$ solid
② Shade

Shade
Plug in (0,0)
 $-5(0) + 4(0) \leq 4$
 $0 \leq 4$
True, shade towards (0,0)

Shade
Plug in (0,0)
 $y > \frac{5}{4}x - 4$
 $0 > \frac{5}{4}(0) - 4$
 $0 > -4$
True, shade towards (0,0)

Point in the solution set: (0,0)

Check

Slope rule

positive
up/down
right

$$\frac{-5}{3} \quad \text{down 5} \quad \text{right 3}$$

$$\frac{10}{7} \quad \text{up 10} \quad \text{right 7}$$

$$2 = \frac{2}{1} \quad \text{up 2} \quad \text{right 1}$$

$$-8 = \frac{-8}{1} \quad \text{down 8} \quad \text{right 1}$$

$14w^2v^8$ and $4w^7y^3v^4$ Find LCM

Does 4 divide into $14 \times 1 = 14$? No
 $14 \times 2 = 28$? Yes

$28w^7y^3v^8$

For the variables, take biggest exponent

check $\frac{28w^7y^3v^8}{14w^2v^8} = 2w^5y^3$ (No denominator) ✓

$\frac{28w^7y^3v^8}{4w^7y^3v^4} = 7v^4$ (No denominator) ✓

$\frac{y^2 - 7y - 18}{y^2 - 4}$

Find all values where x is undefined
 Set denominator = 0

$y^2 - 4 = 0$
 $(y+2)(y-2) = 0$
 $y+2=0 \quad y-2=0$
 $y=-2, 2$

OR $y^2 - 4 = 0$
 $y = \pm 2$
 $y = 2, -2$

$(-3)^3 = (-3)(-3)(-3) = -27$

$(-6)^2 = (-6)(-6) = 36$

$\frac{5 \times 5}{6 \times 5} - \frac{3 \times 6}{5 \times 6}$

$\frac{LCD}{30}$

$\frac{25}{30} - \frac{18}{30} = \frac{7}{30}$ Keep denominator same

$-\frac{7}{3}y = 35$
 $-7y = 105$
 $y = -15$

You can always plug back in to check your answer

$-\frac{7}{3}(-15) \stackrel{?}{=} 35$
 $35 = 35$

$-\sqrt{72} - 5\sqrt{32}$
 $-6\sqrt{2} - 20\sqrt{2}$
 $-26\sqrt{2}$

Simplify first

$-b \pm \sqrt{b^2 - 4ac}$

$$5x^2 + 4x + 3 = 0$$

$$a=5 \quad b=4 \quad c=3$$

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

$$\sqrt{16-60}$$

$$\sqrt{-44}$$

$$2i\sqrt{11}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$ax^2 + bx + c = 0$$

negative under square root
you put an i
 $i = \sqrt{-1}$

$$\frac{-4 \pm 2i\sqrt{11}}{10}$$

All 3 terms
divisible
by 2

$$2i\sqrt{11}$$

Complex number $a + bi$

$$\frac{-2 \pm i\sqrt{11}}{5}$$

$$x = \frac{-2}{5} + \frac{\sqrt{11}}{5}i, \frac{-2}{5} - \frac{\sqrt{11}}{5}i$$

Final Knowledge Check Practice
Question 11 of 43 (2 points) | Question Attempts: 1 of Unlimited

1 2 3 4 5 6 7 8 9 10 **11** 12 13

At the movie theatre, child admission is \$5.40 and adult admission is \$9.90. On Thursday, four times as many adult tickets as child tickets were sold, for a total sales of \$900.00. How many child tickets were sold that day?

Answer Submitted:

Number of child tickets:

Correct Answer: 20

Child: 5.40
adult: 9.90
total: 900

child = x
adults = 4x

$$5.40x + 9.90(4x) = 900$$

$$5.40x + 39.6x = 900$$

$$\frac{45x}{45} = \frac{900}{45}$$

$$x = 20$$

A cyclist traveled 11 kilometers per hour faster than an in-line skater. In the time it took the cyclist to travel 18 kilometers, the skater had gone 9 kilometers. Find the speed of the skater.

Answer Submitted:

Speed of the skater: kilometers/hour

Correct Answer:

Speed of the skater: 11 kilometers/hour

	Km	Km/hr
cyclist	18	$x + 11$
skater	9	x

skater

$$\frac{18}{x+11} = \frac{9}{x}$$

cross multiply

$$18x = 9(x+11)$$

$$18x = 9x + 99$$

$$\frac{9x}{9} = \frac{99}{9} \quad x = 11$$

$$N = (0, -5)$$

$$C = (-7, 2)$$

Find distance

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$\sqrt{(-7-0)^2 + (2-(-5))^2}$$

$$\sqrt{49 + 49}$$

$$\sqrt{98}$$

$$\begin{array}{r} 10 \\ 2 \overline{) 20} \\ \underline{20} \\ 0 \end{array}$$

$$7\sqrt{2}$$

$$h(x) = \frac{x-1}{x^2-10x+9}$$

Find values of x NOT in domain

$$\begin{array}{r} +9 \\ -1 \times -9 \\ \hline -10 \end{array}$$

$$x^2 - 10x + 9 = 0$$

$$(x-1)(x-9) = 0$$

$$x-1=0$$

$$x-9=0$$

$$\boxed{x=1 \quad x=9}$$

can't divide by 0
Set denom. = 0

Left on together, the cold and hot water faucets of a certain bathtub take 5 minutes to fill the tub. If it takes the hot water faucet 15 minutes to fill the tub by itself, how long will it take the cold water faucet to fill the tub on its own?

Do not do any rounding.

Answer Submitted:

minutes

Correct Answer:

7.5 minutes

$$\frac{1}{5} = \frac{1}{15} + \frac{1}{x}$$

$$\frac{\text{Find LCD}}{15x}$$

$$3x = x + 15$$

$$\frac{2x}{2} = \frac{15}{2} \quad \boxed{x=7.5}$$

$$\begin{array}{l} \text{FOIL} \left(\sqrt{11} - \sqrt{2} \right) \left(\sqrt{11} + \sqrt{2} \right) \\ \text{FOIL} \left(\sqrt{11} + \sqrt{2} \right) \left(\sqrt{11} - \sqrt{2} \right) \end{array}$$

top

$$\begin{array}{r} \sqrt{121} - \sqrt{22} \\ - \sqrt{22} + \sqrt{4} \\ \hline 11 - 2\sqrt{22} + 2 \\ 13 - 2\sqrt{22} \end{array}$$

bottom

Rationalizing the Denom.

can't have $\sqrt{\quad}$
in denom
Multiply by conjugate
of the denom.

$a+b$) conjugates
 $a-b$

$$\boxed{\frac{13-2\sqrt{22}}{9}}$$

$$\begin{array}{r}
 150'' \\
 \hline
 \sqrt{121} - \sqrt{22} \\
 + \sqrt{22} - \sqrt{4} \\
 \hline
 11 \qquad - 2 \\
 9
 \end{array}$$

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