§1.6 questions?

Practice Test Questions?

$x^2 - 4x + 1 \Rightarrow$

$a = 1,\ b = -4,\ c = 1 \Rightarrow$

$b^2 - 4ac = (-4)^2 - 4(1)(1)$

$= 16 - 4$

$= 12$, which is not a perfect square

$\Rightarrow$ $x^2 - 4x + 1$ doesn't factor over the rationals, i.e., AC method or "Box method" won't work.

$\Rightarrow$ We need a "cheat."

So, $\sqrt{b^2 - 4ac} = \sqrt{12} = \sqrt{\underline{2 \cdot 2} \cdot 3} = 2\sqrt{3}$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-4) \pm 2\sqrt{3}}{2(1)} = \frac{4 \pm 2\sqrt{3}}{2} = \frac{\cancel{2}(2 \pm 1\sqrt{3})}{\cancel{2}}$$

$$= 2 \pm \sqrt{3}$$

$\Rightarrow x^2 - 4x + 1 = (x - (2 + \sqrt{3}))(x - (2 - \sqrt{3}))$

2	37800
2	18900
2	9450
3	4725
3	1575
3	525
5	175
5	35
	7

37800

378 100

Bruckin

$\sqrt{2^3 \cdot 3^3 \cdot 5^2 \cdot 7}$

$= \sqrt{2^2 \cdot 2^1 \cdot 3^2 \cdot 3^1 \cdot 5^2 \cdot 7}$

$= \sqrt{\underline{2 \cdot 2} \cdot \underline{3 \cdot 3} \cdot \underline{5 \cdot 5} \cdot 2 \cdot 3 \cdot 7}$

$= 2 \cdot 3 \cdot 5 \sqrt{42}$

$= 30\sqrt{42}$

$$\begin{array}{r|l} 2 & 2310 \\ 3 & 1155 \\ 5 & 385 \\ 7 & 77 \\ & 11 \end{array} \qquad \begin{array}{r|l} 2 & 660 \\ 2 & 330 \\ 3 & 165 \\ 5 & 55 \\ & 11 \end{array}$$

$$\Rightarrow \frac{2310}{660} = \frac{\cancel{2}\cdot\cancel{3}\cdot\cancel{5}\cdot 7\cdot\cancel{11}}{2\cdot\cancel{2}\cdot\cancel{3}\cdot\cancel{5}\cdot\cancel{11}} = \frac{7}{2}$$

73 is prime!

$\sqrt{73} = 8.\ldots$

No farther than 8 in search for prime factors.

$(x+1)^5 = (x+1)(x+1)(x+1)(x+1)(x+1)$

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1

$(2x-5y)^4$

$= 1(2x)^4 + 4(2x)^3(-5y) + 6(2x)^2(-5y)^2 + 4(2x)^1(-5y)^3 + 1(-5y)^4$

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

Margot

$= 16x^4 - 160x^3y + 600x^2y^2 - 1000xy^3 + 625y^4$

§1.6 #25

5.9×10^{12} mi = 1 light year

1.7×10^{6} light years to Andromeda Gal.

$$\left(1.7 \times 10^{6}\ \cancel{\text{light years}}\right)\left(\frac{5.9 \times 10^{12}\text{ mi}}{1\ \cancel{\text{light yr}}}\right) = 10.03 \times 10^{18}$$

$$= 1.003 \times 10^{19}$$

$\boxed{60 \text{ mph} = 88 \text{ ft/s}}$

10,030,000,000,000,000,000

FINAL IS COMPREHENSIVE
i.e. CUMULATIVE.

15 x 12

S1.6
#27b

60 million
\$422 Billion in debt

Answer to nearest \$1

$$\frac{422 \text{ Billion dollars}}{60 \text{ million households}}$$

$10^{9-6} = 10^3$

$$= \frac{422 \times 10^9}{60 \times 10^6} \approx 7.033333 \times 10^3$$

$= 7033.333$

Blaise Pascal

$$\frac{422}{60} =$$

Simplify

$$\frac{\left(3x^2y^{-3}\right)^{-4}}{\left(15x^2y^4\right)^{-2}}$$

Final answer using only positive exponents. Assume all variables are nonzero.

Factor completely

$75x^2-48y^6$

Adam

$$\frac{(3x^2y^{-3})^{-4}}{(15x^2y^4)^{-2}} = \frac{3^{-4}(x^2)^{-4}(y^{-3})^4}{15^{-2}(x^2)^{-2}(y^4)^{-2}} = \frac{3^{-4}x^{-8}y^{12}}{3^{-2}5^{-2}x^{-4}y^{-8}}$$

$$= 3^{-4+2}5^{2}x^{-8+4}y^{12+8}$$

$$\frac{(15x^2y^{-3})^2}{(3x^2y^{-3})^4}$$

$$= 3^{-2}5^{2}x^{-4}y^{20} = \boxed{\frac{5^2y^{20}}{3^2x^4}}$$

$$15^{-2} = (3 \cdot 5)^{-2} = 3^{-2}5^{-2}$$

$$= \frac{1}{3^2 \cdot 5^2}$$

$$3^{-4} \neq -12$$

non -3^4

$$75x^2 - 48y^6$$

$$= 3\left[25x^2 - 16y^6\right]$$

$$= 3\left[(5x)^2 - 4^2(y^2)^3\right]$$

a cube of a square.

$$= 3\left[(5x)^2 - 4^2(y^3)^2\right] = 3\left[(5x)^2 - (4y^3)^2\right]$$

is a square of a cube.

$$= 3\ (5x - 4y^3)(5x + 4y^3)$$