Kevrew
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Solve for x:

1) $\frac{2}{3} + \frac{4}{x} = \frac{5}{6}$

2) $\frac{2}{x+5} + \frac{20}{x^2-25} = 1$

3) $2(3x-4)^{\frac{3}{5}} - 4 = 50$

4) $(x-6)^{-1/2} + 5 = 3$

5) $4^{x+1} = 8^{x}$

6) $\left(\frac{1}{9}\right)^{x} = 27^{1-x}$

29. Solve for x and express your answer in simplest radical form:

$$\frac{4}{x} - \frac{3}{x+1} = 7$$

16. If $(a^x)^{\frac{2}{3}} = \frac{1}{a^2}$, what is the value of x?
(1) 1 (2) 2 (3) −3 (4) −1

22. Solve for m: $3^{m+1} - 5 = 22$

31. An archaeologist can determine the approximate age of certain ancient specimens by measuring the amount of carbon-14, a radioactive substance, contained in the specimen. The formula used to determine the age of a specimen is $A = A_0 2^{\frac{-t}{5760}}$, where A is the amount of carbon-14 that a specimen contains, A_0 is the original amount of carbon-14, t is time, in years, and 5760 is the half-life of carbon-14.

A specimen that originally contained 120 milligrams of carbon-14 now contains 100 milligrams of this substance. What is the age of the specimen, to the *nearest hundred years*?

28. An amount of P dollars is deposited in an account paying an annual interest rate r (as a decimal) compounded n times per year. After t years, the amount of money in the account, in dollars, is given by the equation $A = P\left(1 + \frac{r}{n}\right)^{nt}$.

Rachel deposited $1,000 at 2.8% annual interest, compounded monthly. In how many years, to the *nearest tenth of a year,* will she have $2,500 in the account? [The use of the accompanying grid is optional.]

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Solve for x:

Answers

1) $\frac{2}{3} + \frac{4}{x} = \frac{5}{6}$

$x = 24$

2) $\frac{2}{x+5} + \frac{20}{x^2-25} = 1$

$x = 7$, $\cancel{x = -5}$ extraneous

3) $2(3x-4)^{\frac{3}{5}} - 4 = 50$

$\frac{85}{3}$

4) $(x-6)^{-1/2} + 5 = 3$

$\emptyset$

extraneous sol $\cancel{x = 6.25}$

5) $4^{x+1} = 8^{x}$

$x = 2$

6) $\left(\frac{1}{9}\right)^{x} = 27^{1-x}$

$x = 3$

$3 \cdot 28 \cdot 4$

$112 + 36 = 148$

29. Solve for x and express your answer in simplest radical form:

$$\frac{4}{x} - \frac{3}{x+1} = 7$$

$4(x+1) - 3x = 7(x^2+x)$

$4x + 4 - 3x = 7x^2 + 7x$

$7x^2 + 6x - 4 = 0$

$x = \dfrac{-6 \pm \sqrt{36 - 4(7)(-4)}}{2(7)} = \dfrac{-6 \pm \sqrt{148}}{14}$

$= \dfrac{-6 \pm 2\sqrt{37}}{14}$

$= \boxed{\dfrac{-3 \pm \sqrt{37}}{7}}$

16. If $(a^x)^{\frac{2}{3}} = \frac{1}{a^2}$, what is the value of x?

(1) 1 (2) 2 (3) −3 (4) −1

$a^{\frac{2}{3}x} = a^{-2}$

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

22. Solve for m: $3^{m+1} - 5 = 22$

$3^{m+1} = 27$

$3^{m+1} = 3^3$

$m = 2$

Algebra method

$100 = 120(2)^{-x/5760}$

$\frac{100}{120} = 2^{-x/5760}$

$\log \frac{100}{120} = -\frac{x}{5760} \log 2$

$1515.078 = x$

$\boxed{1500 \text{ yrs}}$

31. An archaeologist can determine the approximate age of certain ancient specimens by measuring the amount of carbon-14, a radioactive substance, contained in the specimen. The formula used to determine the age of a specimen is $A = A_0 2^{\frac{-t}{5760}}$, where A is the amount of carbon-14 that a specimen contains, A_0 is the original amount of carbon-14, t is time, in years, and 5760 is the half-life of carbon-14.

A specimen that originally contained 120 milligrams of carbon-14 now contains 100 milligrams of this substance. What is the age of the specimen, to the *nearest hundred years*?

Graph method: $100 = 120(2)^{-t/5760}$

$y_1 = 120(2)^\wedge(-x/5760)$

$y_2 = 100$

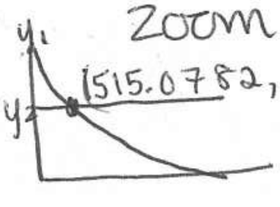
$\boxed{1500 \text{ years}}$

to find window

X min 0

X max 5000

zoom 0



28. An amount of P dollars is deposited in an account paying an annual interest rate r (as a decimal) compounded n times per year. After t years, the amount of money in the account, in dollars, is given by the equation $A = P\left(1 + \frac{r}{n}\right)^{nt}$.

Rachel deposited \$1,000 at 2.8% annual interest, compounded monthly. In how many years, to the *nearest tenth of a year,* will she have \$2,500 in the account? [The use of the accompanying grid is optional.]

$$A = 1000\left(1 + \frac{.028}{12}\right)^{(12x)}$$

$$y_1 = 1000\left(1 + \frac{.028}{12}\right)\wedge(12x)$$

$$y_2 = 2500$$

$\boxed{32.8 \text{ years}}$