AAT

Week 2

1) Jessica and Arjun each improved their yards by planting grass sod and ivy. They bought their supplies from the same store. Jessica spent \$167 on 9 ft² of grass sod and 11 pots of ivy. Arjun spent \$76 on 2 ft² of grass sod and 8 pots of ivy. Find the cost of one ft² of grass sod and the cost of one pot of ivy.

See pg 3

2) The school that Shreya goes to is selling tickets to a fall musical. On the first day of ticket sales the school sold 14 senior citizen tickets and 6 student tickets for a total of \$246. The school took in \$192 on the second day by selling 10 senior citizen tickets and 7 student tickets. What is the price each of one senior citizen ticket and one student ticket?

See pg 3

Divide.

synthetic OR long divide

3) $(24n + 9n^4 - 21n^3 - 52) \div (3n - 7)$

4) $(2n^5 - 5n^4 - 8n^3 + 20n^2 + 1) \div (2n - 5)$

5) $(24x^5 - 9 - 54x - 11x^3 - 21x^4 + 15x^2) \div (1 + 8x)$

See pg 3

State the possible rational zeros for each function.

6) $f(x) = \overset{d}{x^3} + 5x^2 - 30x + \overset{n}{18}$

$\pm\left(\frac{1, 2, 3, 6, 9, 18}{1}\right)$

7) $f(x) = 3x^3 + 5x^2 + x - 1$

$\pm \frac{1}{1, 3} = \pm 1, \pm 1/3$

Expand each logarithm.

8) $\log \frac{x}{y} = \log x - \log y$

9) $\log x^3 = 3 \log x$

10) $\log_7 (ab^6)^6 = 6(\log_7 a + 6 \log_7 b)$

11) $\log_9 (u^3v^4) = 3 \log_9 u + 4 \log_9 v$

12) $\log_2 \sqrt{a \cdot b \cdot c} = 1/2(\log_2 a + \log_2 b + \log_2 c)$

Condense each expression to a single logarithm.

13) $4\log_7 u - 20\log_7 v$

$= \log_7\left(\frac{u^4}{v^{20}}\right)$

14) $\log_8 z + \frac{\log_8 x}{2} + \frac{\log_8 y}{2}$

$\log_8\left(z \cdot x^{1/2} \cdot y^{1/2}\right)$

15) $3\log_2 a + 18\log_2 b$

$\log_2\left(a^3 b^{18}\right)$

16) $12\log_4 a + 6\log_4 b$

$\log_4\left(a^{12} b^6\right)$

Use a calculator to approximate each to the nearest thousandth.

17) $\log 55 = 1.740$

18) $\log_2 53 = \frac{\log 53}{\log 2} = 5.728$

Solve each equation.

check solutions!

19) $\log_4 6 + \log_4 2x^2 = \log_4 12$

20) $\log_2 10 + \log_2 (x+7) = 4$

21) $\log_5 (x^2 - 9) - \log_5 8 = 1$

22) $\log 4x - \log 6 = \log 39$

19. $\cancel{\log_4}(12x^2) = \cancel{\log_4} 12$

$12x^2 = 12$

$x^2 = 1$

$\boxed{x = \pm 1}$

20. $\log_2 (10x + 70) = 4$

$2^4 = 10x + 70$

$16 = 10x + 70$

$-54 = 10x$

$\boxed{-5.4 = x}$

21. $\log_5\left(\frac{x^2-9}{8}\right) = 1$

$5^1 = \frac{x^2-9}{8}$

$5 = \frac{x^2-9}{8}$

$40 = x^2 - 9$

$49 = x^2$

$\boxed{\pm 7 = x}$

22. $\cancel{\log}\left(\frac{4x}{6}\right) = \cancel{\log} 39$

$\frac{4x}{6} = 39$

$4x = 234$

$\boxed{x = 58.5}$

AAT week 2

1. $(167 = 9s + 11i) \cdot 2$
   $(76 = 2s + 8i) \cdot -9$

$$\begin{array}{rl} & 334 = \cancel{18s} + 22i \\ + & -684 = \cancel{-18s} - 72i \\ \hline & -350 = -50i \\ & 7 = i \end{array}$$

$2s + 8(7) = \$56$
$2s + 56 = 76$
$2s = 20$
$s = 10$

$\boxed{\begin{array}{l} \$7 \mid \text{per ivy} \\ \$10 \mid \text{per sod} \end{array}}$

2. $(14s + 6t = 246) \cdot 7$
   $(10s + 7t = 192) \cdot -6$

$$\begin{array}{l} 98s + \cancel{42t} = 1722 \\ -60s - \cancel{42t} = -1152 \\ \hline 38s = 570 \\ s = 15 \end{array}$$

$10(15) + 7t = 192$
$150 + 7t = 192$
$7t = 42$
$t = 6$

$\boxed{\begin{array}{l} \$15 \mid \text{senior} \\ \$6 \mid \text{student} \end{array}}$

3.

$$\begin{array}{r|rrrrr} 7/3 & 9 & -21 & 0 & 24 & -52 \\ & \downarrow & 21 & 0 & 0 & 56 \\ \hline & 9 & 0 & 0 & 24 & \boxed{4} \end{array}$$

$$\boxed{9n^3 + 24 + \frac{4}{x - 7/3}}$$

has to be w/ fractions

☆ your ans. will be different but equal w/ long divide

4.

$\frac{5}{2}$	2	-5	-8	20	0	1
	↓	5	0	-20	0	0
	2	0	-8	0	0	$\boxed{1}$

$$\boxed{2n^4 - 8n^2 + \frac{1}{x - \frac{5}{2}}}$$

5.

$-\frac{1}{8}$	24	-21	-11	15	-54	-9
	↓	-3	3	1	-2	7
	24	-24	-8	16	-56	$\boxed{-2}$

$$\boxed{24x^4 - 24x^3 - 8x^2 + 16x - 56 - \frac{2}{x + \frac{1}{8}}}$$