Test 5

1) B

2) C $-5X^2 + 20 =$
$-5(X^2 - 4) =$
$-5(X - 2)(X + 2)$

3) A $2X^3 - X^2 - 3X =$
$X(2X^2 - X - 3) =$
$X(X + 1)(2X - 3)$

4) C $Y^4 - 625 =$
$(Y^2 - 25)(Y^2 + 25) =$
$(Y - 5)(Y + 5)(Y^2 + 25)$

5) B $2X^2 + 4X = 6 \rightarrow 2(X^2 + 2X - 3) = 0$
$(X + 3)(X - 1) = 0$
$X + 3 = 0 \qquad X - 1 = 0$
$X = -3 \qquad X = 1$

6) A $-6X^2 = -27X + 12 \rightarrow -3(2X^2 - 9X + 4) = 0$
$(2X - 1)(X - 4) = 0$
$2X - 1 = 0 \qquad X - 4 = 0$
$X = \dfrac{1}{2} \qquad X = 4$

7) C $\dfrac{4}{X+2} - \dfrac{2X}{2} = \dfrac{(2)4}{(2)(X+2)} - \dfrac{2X(X+2)}{2(X+2)} =$
$\dfrac{8 - 2X^2 - 4X}{2(X+2)} = \dfrac{-2(X^2 + 2X - 4)}{2(X+2)} =$
$\dfrac{-(X^2 + 2X - 4)}{X+2} \qquad (X \neq -2)$

8) A $\dfrac{3}{X+4} - \dfrac{2X}{-X+4} + \dfrac{X^2}{X^2 - 16} =$
$\dfrac{3}{X+4} - \dfrac{-2X}{X-4} + \dfrac{X^2}{X^2 - 16} = \qquad (X \neq 4, -4)$
$\dfrac{3(X-4)}{(X+4)(X-4)} - \dfrac{-2X(X+4)}{(X-4)(X+4)} + \dfrac{X^2}{X^2 - 16} =$
$\dfrac{3X - 12 + 2X^2 + 8X + X^2}{X^2 - 16} = \dfrac{3X^2 + 11X - 12}{X^2 - 16}$

9) D $\dfrac{2 + \frac{6}{A}}{3 + \frac{12}{A-1}} = \dfrac{\frac{2A}{A} + \frac{6}{A}}{\frac{3(A-1)}{(A-1)} + \frac{12}{A-1}} = \dfrac{\frac{2A+6}{A} \cdot \frac{A-1}{3A+9}}{\frac{3A+9}{A-1} \cdot \frac{A-1}{3A+9}}$

$\dfrac{(2A+6)(A-1)}{A(3A+9)} = \dfrac{2(A+3)(A-1)}{3A(A+3)} = \dfrac{2(A-1)}{3A}$

$(X \pm 0, 1)$

10) C $\dfrac{\frac{X^2+9X+20}{X^3-9X}}{\frac{X^2+8X+16}{X^2+X-12}} = \dfrac{\frac{(X+4)(X+5)}{X(X-3)(X+3)} \cdot \frac{(X+4)(X-3)}{(X+4)(X+4)}}{\frac{(X+4)(X+4)}{(X+4)(X-3)} \cdot \frac{(X+4)(X-3)}{(X+4)(X+4)}} =$

$\dfrac{(X+5)}{X(X+3)} \qquad (X \pm 0, -3, 3, -4, 4)$

11) B Any number raised to the zero power equals one

12) C If $Y = mX + b$, m is the slope and a perpendicular line has a slope of $-\dfrac{1}{m}$ or the negative reciprocal of m.

13) A $N + D = 7 \rightarrow 10N + 10D = 70$
$.05N + .10D = .50 \rightarrow -5N - 10N = -50$
$\overline{5N = 20}$
$N = 4$

14) B $(2^2 + 1) - (2^2 - 2) = (4 + 1) - (4 - 2) = 5 - 2 = 3$

15) D $(B^2 + 1) + (B^2 - 2) = 2B^2 - 1$

Test 6

1) C $1000^{2/3} = (\sqrt[3]{1000})^2 = 10^2 = 100$

2) B $\left(\dfrac{25}{81}\right)^{-1/2} = \dfrac{\sqrt{81}}{\sqrt{25}} = \dfrac{9}{5}$

3) C $\left(32^{3/5}\right)^2 = \left[\left(\sqrt[5]{32}\right)^3\right]^2 = (2^3)^2 = 8^2 = 64$

4) D $\left(\dfrac{2}{R^{1/3}}\right)^{-2} = \left(\dfrac{\sqrt[3]{R}}{2}\right)^2 = \dfrac{R^{2/3}}{4} = \dfrac{1}{4}R^{2/3}$

5) D $\left(\dfrac{-1}{\sqrt{25}}\right)^{-3} = \left(\dfrac{5}{-1}\right)^3 = -125$
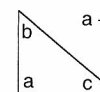
6) A $\sqrt{\sqrt{81}} = \left(81^{1/2}\right)^{1/2} = 81^{1/4} = 3$

7) A $\sqrt{\sqrt[3]{B^{12}}} = \left(B^{12/3}\right)^{1/2} = B^2$

8) D $\left(\sqrt[3]{27}\right)^4 = 27^{4/3} = (3)^4 = 81$

9) B $\left(\sqrt[3]{64}\right)^{-2} = 64^{-2/3} = \dfrac{1}{4^2} = \dfrac{1}{16}$

10) B $\left(\dfrac{3}{\sqrt{\sqrt{16}}}\right)^{-2} = \left(\dfrac{16^{1/4}}{3}\right)^2 = \left(\dfrac{2}{3}\right)^2 = \dfrac{4}{9}$

11) B $a + b + c = 180°$ True for all triangles

12) D Equations with 3 variables produce a 3-dimensional figure (Lesson 20)

13) C Area of large rectangle $\rightarrow$ $6 \times 5 = 30$ ft²
Area of shaded square $\rightarrow$ $2 \times 2 = 4$ ft²
Area of shaded triangle $\rightarrow$ $(\frac{1}{2})(1)(2) = 1$ ft²
$30 - (4 + 1) = 25$ ft²

14) A Sam missed $2 \times 30\%$ or 60%
$(.60)(60) = 36$ wrong answers.
$60 - 36 = 24$ correct answers for Sam.

15) C $93{,}000{,}000 = 9.3 \times 10^7$ $.3 = 3.0 \times 10^{-1}$
$\dfrac{9.3 \times 10^7}{.3 \times 10^{-1}} = (9.3 \div 3.0)(10^7 \div 10^{-1})$
$= 3.1 \times 10^8$