Tonight's HW: Worksheet 8.1

Adv. Alg.-Trig.
Homework – Fraction Review Ditto

2) $\frac{19a}{20}$ 4) $\frac{11a}{12}$ 6) $\frac{29x}{24}$ 8) $\frac{17x}{9}$ 10) $\frac{29a}{30}$

12) $\frac{4x+7}{(x-1)(x+1)}$ 14) $\frac{6x-8}{(x+8)(x-6)}$ 16) $\frac{y}{6(y+2)}$

18) $\frac{8x+14}{(x-8)(x+8)}$ 20) $\frac{10x-53}{10(x-5)(x+5)}$

5

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16) $2\left(\frac{2y}{3(y+2)}\right) - \left(\frac{y}{2(y+2)}\right)3$ LCD $= 6(y+2)$

$= \frac{4y-3y}{6(y+2)} = \frac{y}{6(y+2)}$

20) $\frac{5(x+5)}{5(x-5)}\left(\frac{8}{4(x+5)}\right) - \left(\frac{3}{5(x^2-25)}\right)\frac{4}{4}$ $\quad LCD = 20(x+5)(x-5)$

$= \frac{40(x-5) - 12}{20(x+5)(x-5)} = \frac{40x-200-12}{} = \frac{40x-212}{}$

$= \frac{4(10x-53)}{\cancel{20}_{5}(x+5)(x-5)} = \frac{10x-53}{5(x+5)(x-5)}$

Warm-Up

Simplify.

1) $\dfrac{\dfrac{\cos A}{\sin A}}{\dfrac{1}{\cos A}}$ $\dfrac{\cos A}{\sin A} \cdot \dfrac{\cos A}{1}$ $\dfrac{\cos^2 A}{\sin A}$

2) $\dfrac{\cos A}{\dfrac{1}{\cos A}}$ $\dfrac{\cos A}{1} \cdot \dfrac{\cos A}{1}$ $\cos^2 A$

Factor.

3) $\tan^2 A - 1$ $(\tan A + 1)(\tan A - 1)$

4) $2\cos x - 4$ $2(\cos x - 2)$

5) $\sin^2 x + 8\sin x + 7$ P: 7 S: 8 7, 1

$\sin^2 x + \sin x + 7\sin x + 7$

$\sin x(\sin x + 1) + 7(\sin x + 1)$

$(\sin x + 7)(\sin x + 1)$

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Proving Identities

Fundamental Identities

Reciprocal Identities:

$$Cot\theta = \frac{1}{Tan\theta} \qquad Sec\theta = \frac{1}{Cos\theta} \qquad Csc\theta = \frac{1}{Sin\theta}$$

$$Tan\theta = \frac{1}{Cot\theta} \qquad Cos\theta = \frac{1}{Sec\theta} \qquad Sin\theta = \frac{1}{Csc\theta}$$

Any relationship may be raised to any power.

ie.) $Cot^2\theta = \frac{1}{Tan^2\theta}$ **(or)** $Sec^2\theta = \frac{1}{Cos^2\theta}$

Quotient Identities:

$$Tan\theta = \frac{Sin\theta}{Cos\theta} \qquad Cot\theta = \frac{Cos\theta}{Sin\theta}$$

Also... $Tan^2\theta = \frac{Sin^2\theta}{Cos^2\theta}$ $Cot^2\theta = \frac{Cos^2\theta}{Sin^2\theta}$

Pythagorean Identities:

$\tan\theta = \frac{\sin\theta}{\cos\theta}$

$\cot\theta = \frac{\cos\theta}{\sin\theta}$

* 1) $Sin^2\theta + Cos^2\theta = 1$

÷ by $\cos^2\theta$ $\frac{}{\cos^2\theta}$ $\frac{}{\cos^2\theta}$

2) $Tan^2\theta + 1 = \sec^2\theta$

÷ by $\sin^2\theta$

3) $Cot^2\theta + 1 = Csc^2\theta$

Using Identities to Simplify Expressions:

1) Write each expression in terms of (sin & cos)
2) Simplify each expression

Examples:

1) $\frac{SinA}{CscA} = \frac{\sin A}{\left(\frac{1}{\sin A}\right)} = \frac{\sin A}{1} \cdot \frac{\sin A}{1} = \sin^2 A$

2) $\sec B \csc B$

$= \frac{1}{\cos B} \cdot \frac{1}{\sin B}$

$= \frac{1}{\sin B \cos B}$

Pythid
$\sin^2 x + \cos^2 x = 1$

3) $TanD + CotD$

$\frac{\sin D}{\cos D} = \frac{\sin D}{\cos D} + \frac{\cos D}{\sin D} \cdot \frac{\cos D}{\cos D}$

$\frac{\sin^2 D + \cos^2 D}{\sin D \cos D}$

$\frac{1}{\sin D \cos D}$

4) $TanA(CosA + CscA)$

$\frac{SinA}{CosA}\left(\frac{SinA}{CosA}\cdot\frac{1}{SinA} + \frac{1}{SinA}\right)$

$\frac{SinA}{CosA}\left(\frac{SinACosA + 1}{SinA}\right)$

$\frac{SinACosA + 1}{CosA}$

5) $(SecC + 1)(SecC - 1)$

$Sec^2C - 1$

$(\tan^2\theta + 1) - 1$

$\tan^2\theta = \frac{Sin^2\theta}{Cos^2\theta}$

$\tan^2\theta - 1 = Sec^2\theta$

6) $\dfrac{Tan^2A}{(Tan^2A+1)}$

$= \dfrac{\tan^2A}{\sec^2A} = \dfrac{\left(\dfrac{\sin^2A}{\cos^2A}\right)}{\left(\dfrac{1}{\cos^2A}\right)} = \dfrac{\sin^2A}{\cancel{\cos^2A}} \cdot \dfrac{\cancel{\cos^2A}}{1}$

$= \sin^2A$

$$\sin^2 x + \cos^2 x = 1$$

$$-\cos^2 x \quad -\cos^2 x$$

$$\sin^2 x = 1 - \cos^2 x$$

$$\cos^2 x = 1 - \sin^2 x$$

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