MATH 151 Winter 2006 Calculus

In-class Work 0 Solutions

1. $$\frac{w^3+3z^2}{w^3-9z^4w^{-3}}+\frac{3}{3-w^3z^{-2}}=\frac{(w^3+3z^2)w^3}{(w^3-9z^4w^{-3})w^3}+\frac{(3)z^2}{(3-w^3z^{-2})z^2}$$

$$=\frac{w^6+3z^2w^3}{w^6-9z^4}+\frac{3z^2}{3z^2-w^3}=\frac{w^6+3z^2w^3}{w^6-9z^4}+\frac{(3z^2)(3z^2+w^3)}{(3z^2-w^3)(3z^2+w^3)}$$

$$=\frac{(w^6-3z^2w^3)-(9z^4+3z^2w^3)}{w^6-9z^4}=\frac{w^6+3z^2w^3-9z^4-3z^2w^3)}{w^6-9z^4}$$

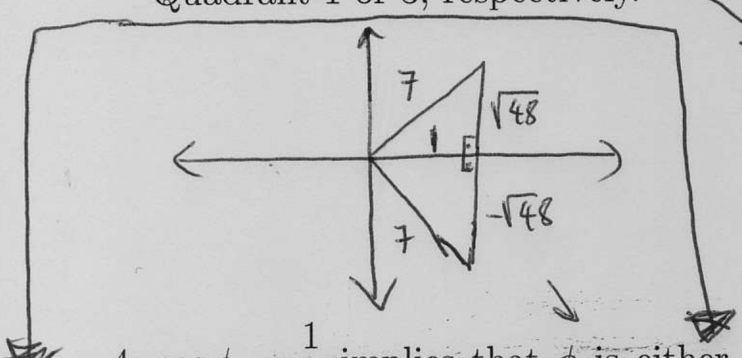
$$=\frac{w^6z-9z^4}{w^6-9z^4}=1$$

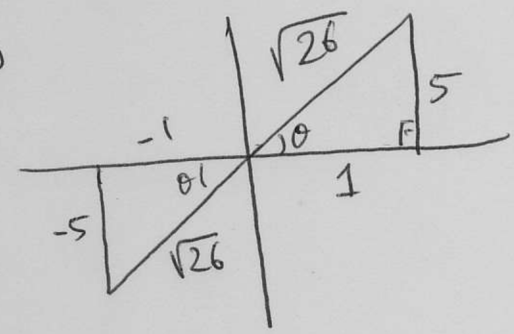
2. $$\frac{1}{\sqrt{25x^6+\frac{1}{7x^2}}-5x^3}=\frac{\sqrt{25x^6+\frac{1}{7x^2}}+5x^3}{(\sqrt{25x^6+\frac{1}{7x^2}}-5x^3)(\sqrt{25x^6+\frac{1}{7x^2}}+5x^3)}$$

$$=\frac{\sqrt{25x^6+\frac{1}{7x^2}}+5x^3}{25x^6+\frac{1}{7x^2}-25x^6}=\frac{\sqrt{25x^6+\frac{1}{7x^2}}+5x^3}{\frac{1}{7x^2}}=(\sqrt{25x^6+\frac{1}{x^5}}+5x^3)7x^2$$

$$=7\sqrt{25x^{10}+\frac{x^4}{7x^2}}+35x^5=7\sqrt{25x^{10}+\frac{x^2}{7}}+35x^5$$

3. $\tan\theta = 5$ implies that θ is either in the first or third quadrant. By the following picture, we get $\cos\theta = \frac{1}{\sqrt{26}}$ or $-\frac{1}{\sqrt{26}}$ depending on whether θ is in Quadrant 1 or 3, respectively.





4. $\cos\phi = \frac{1}{7}$ implies that ϕ is either in the first or fourth quadrant. By the picture above, we get $\tan\phi = \sqrt{48}$ or $-\sqrt{48}$ depending on whether ϕ is in quadrant 1 or 4, respectively.