KFUPM
Math001
22 Sep 07

NAME:
ID:
Sec: Serial:

QUIZ # 1 (A)

1) Write without absolute values and give the reason

$\left|\dfrac{|x-3|+|x+5|}{|4-x|}\right|$ if $-5 \le x \le 3$

$x-3<0 \Rightarrow |x-3| = 3-x$

$x+5>0 \Rightarrow |x+5| = x+5$

$x-4<0 \Rightarrow$ ~~then~~ $4-x>0$

$\Rightarrow |4-x| = 4-x$

$$\left|\frac{|x-3|+|x+5|}{|4-x|}\right| = \frac{\big||x-3|+|x+5|\big|}{\big||4-x|\big|} = \frac{|x-3|+|x+5|}{|4-x|} = \frac{(3-x)+(x+5)}{4-x} = \frac{8}{4-x}$$

2) State the property of addition , multiplication or equality in each statement;

a) $ab = cd$ then $cd = ab$ Symmetry of equality

b) $(2a+3b)+4c = 2a+(3b+4c)$ Associative prop. of +

c) Since π and $\sqrt{2}$ are real numbers, then $\pi\sqrt{2}$ is a real number also.

Closure of multiplication.

3) For each statement, determine if it is true or false and say why

A) For any real number x, then $(-x-3)$ is always negative. False

take $x = -5$ $\quad -(-5)-3 = 2 > 0$

B) If x is any negative number, then $|x^2+4| = x^2+4$. T

$\because \quad x^2+4 \geq 0$

C) $(-2,3)\cap(-\infty,1) = \{x : -2 < x < 3 \text{ or } x < 1\}$ F

should be "and"

4) If x and y are positive, simplify $(27x^3y^{-4})^{2/3}$

$$= (27)^{2/3}(x^3)^{2/3}(y^{-4})^{2/3} = 3^2 . x^2 y^{-8/3} = \frac{9x^2}{y^{8/3}}$$

5) Rationalize the denominator in $\frac{1}{\sqrt[7]{x^3}}$

$$= \frac{1}{\sqrt[7]{x^3}} \cdot \frac{\sqrt[7]{x^4}}{\sqrt[7]{x^4}} = \frac{\sqrt[7]{x^4}}{x}$$

6) If x and y are negative, simplify $\sqrt{18x^6y^4}$

$$= \sqrt{2.3^2x^6y^4}$$

$$= 3\sqrt{2(x^3)^2(y^2)^2} = 3|x^3|\cdot|y^2|\sqrt{2}$$

$x<0$

$y^2>0$

$$= \boxed{3x^2|x|y^2\sqrt{2}} = \boxed{-3x^3y^2\sqrt{2}}$$

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QUIZ # 1 (B)

1) Write without absolute values and give the reason
$\left|\dfrac{|x+3|+|x-5|}{|4-x|}\right|$ *if* $-3 \le x \le 5$

$x+3 \geq 0 \Rightarrow |x+3| = x+3$

$x-5 \leq 0 \Rightarrow |x-5| = 5-x$

$x-4 < 1 \Rightarrow$ we cannot remove the abs values

$|4-x| = |x-4|$

$$\left|\frac{|x+3|+|x-5|}{|4-x|}\right| = \frac{|x+3|+|x-5|}{|4-x|} = \frac{x+3+5-x}{|x-4|} = \boxed{\frac{8}{|x-4|}}$$

2) State the property of addition, multiplication or equality in each statement;
a) $ab = cd$ then $cd = ab$ symmetric Prop of $=$
b) $(2a+3b)+4c = 2a+(3b+4c)$ Associative prop of $+$
c) Since π and $\sqrt{2}$ are real numbers, then $\pi\sqrt{2}$ is a real number also.
Closure of $\times$

3) For each statement, determine if it is true or false and say why

A) For any real number x, then $(x+3)$ is always positive. F
$x = -4 \Rightarrow x+3 = -1 < 0$

B) If x is any negative number, then $|-x^2-4| = -x^2-4$. F
$-x^2-4 < 0$

C) $(-2,3)\cap(-\infty,1) = \{x : -2 < x < 3 \text{ or } x < 1\}$ F
Should be and.

4) If x and y are positive, simplify $(27x^4y^{-3})^{2/3}$

$$= (27)^{2/3}(x^4)^{2/3}(y^{-3})^{2/3} = 3^2\,(x^{8/3}\,y^{-2}) = \frac{9\,x^{8/3}}{y^2}$$

5) Rationalize the denominator in $\dfrac{1}{\sqrt[5]{x^2}}$

$$\frac{1}{\sqrt[5]{x^2}} \cdot \frac{\sqrt[5]{x^3}}{\sqrt[5]{x^3}} = \frac{\sqrt[5]{x^3}}{x}$$

6) If x and y are negative, simplify $\sqrt{27x^8y^6}$ $= \sqrt{3^3(x^4)^2(y^3)^2}$

$= 3|x^4|\cdot|y^3|\sqrt{3}$

$x^4 > 0$, $y^2 > 0$ $= 3(x^4)\,y^2|y|\sqrt{3} \overset{y<0}{=} -3x^4y^3\sqrt{3}$