King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math (001)-Term (131)
Recitation R.6

Question1: The value of $(0.1)^{\frac{1}{2}} \cdot (14.4)^{\frac{1}{2}} + \sqrt[3]{0.064}$

A) $\frac{8}{5}$ B) 0.8 C) 1.24 D) $\frac{2}{5}$ E) $\frac{4}{5}$

Question2: The expression $\frac{(x+y)^{-1}}{x^{-1}+y^{-1}}$ simplifies to:

A) $\frac{xy}{(x+y)^2}$ B) 1 C) -1 D) xy E) $(x+y)^2$

Question3:

The expression $\left(y^{-2}-x^{-2}\right)^{-3n}\left(x^2-y^2\right)^{2n}\left(x^2y^2\right)^{-3n}$ simplifies to

$(a)\frac{1}{\left(x^2-y^2\right)^n}$ $(b)\left(x^2+y^2\right)^n$ $(c)\frac{x^2-y^2}{x^2+y^2}$

$(d)x^n y^n$ $(e)\left(x^2y\right)^{-n}\left(x^2+y^2\right)$

Question4: Answer TRUE OR FALSE

$(a)\sqrt{25x^2-9y^2}=5x-3y$

(b)The expression $\left(x^{-1}+y^{-1}\right)^{-1}=x+y$

(c)The value of $\left(1+2^{-3}\right)^{-1}+\left(1+2^3\right)^{-1}$ is equal to 1.

(d)The expression $\left[x^{-1}-\frac{1}{x-1}-\frac{x+1}{x}\right]$ is equal to $\frac{x}{x+1}$

Solution: (a) is false because: If $x=1$ and $y=1$ then

$$\sqrt{25x^2-9y^2}=\sqrt{25-9}=\sqrt{16}=4\neq 5-3$$

(b) is false becuase: $\left(x^{-1}+y^{-1}\right)^{-1}=\left(\frac{1}{x}+\frac{1}{y}\right)^{-1}=\left(\frac{y+x}{xy}\right)^{-1}=\frac{xy}{x+y}$

(c) is true because:

$$\left(1+2^{-3}\right)^{-1}+\left(1+2^3\right)^{-1}=\left(1+\frac{1}{8}\right)^{-1}+(9)^{-1}=\left(\frac{9}{8}\right)^{-1}+(9)^{-1}=\frac{8}{9}+\frac{1}{9}=1$$

(d) is false because:

Solution:

$$x^{-1}-\frac{1}{x-1}-\frac{x+1}{x}=\frac{1}{x}-\frac{x+1}{x}-\frac{1}{x-1}$$

$$=\frac{1-x-1}{x}-\frac{1}{x-1}$$

$$=-1-\frac{1}{x-1}=\frac{-x+1-1}{x-1}=\frac{-x}{x-1}$$

Question5:

Simplify **(a):** $(-27)^{2/3}$ **(b):** $125^{2/3}$ **(c):** $27^{2/3}$ **(c):** $m^{2/3}\left(m^{7/3}+2m^{1/3}\right)$

Solution:

(a): $(-27)^{2/3}=\left(\sqrt[3]{-27}\right)^2=(-3)^2=9$

(b): $125^{2/3}=\left(\sqrt[3]{125}\right)^2=(5)^2=25$

(c): $27^{2/3}=\left(\sqrt[3]{27}\right)^2=(3)^2=9$

(d): $m^{2/3}\left(m^{7/3}+2m^{1/3}\right)=m^{2/3}m^{7/3}++2m^{2/3}m^{1/3}=m^{\frac{2}{3}+\frac{7}{3}}+2m^{\frac{2}{3}+\frac{1}{3}}=m^{\frac{9}{3}}+2m^{\frac{3}{3}}$

$$=m^3+2m$$

$$=m(m^2+2)$$