9/29/2021

WeBWork Sample Exam 1

#4) a) domain → looking along the x-axis for where f(x) is defined

$$[-8,-6] \cup (-5,3)$$

Note: there is a jump at $x=-2$ but the function still has a y-value there: $y=3$

b) range: looking along the y-axis for all of the y-values that f(x) takes on

$$\to \{-7\} \cup [2,9)$$

$$\to \cancel{[-7]} \cup [2,9)$$

Note: for a single value use { } to enter in WeBWork

WebWork Sample Exam

#6) a) $|3x+3|=6$

$3x+3=6$
$\quad -3 \quad -3$
$3x=3$
$\boxed{x=1}$

$3x+3=-6$
$\quad -3 \quad -3$
$3x=-9$
$\frac{3x}{3}=\frac{-9}{3}$
$\boxed{x=-3}$

Solution set
$\{-3,1\}$

$\boxed{-3,1}$ ← WeBWork

c) $|-(7x+9)|=-14$

No absolute value is ever = - #!

So $\boxed{\text{no solution}}$ ← use text mode "Tt" button in menu on right

#7) b) $|-3x-8|\geq 5$

1) Solve the absolute value equation first

$|-3x-8| = 5$

$-3x-8 = 5$

$\quad +8 \quad +8$

$-3x = 13$

$\boxed{x = -\frac{13}{3}}$

$-3x-8 = -5$

$\quad +8 \quad +8$

$\frac{-3x}{-3} = \frac{3}{-3}$

$\boxed{x = -1}$

2) Partition the # line $|-3x-8| \geq 5$

$|-3(-5)-8| \overset{?}{\geq} 5$

$|15-8| \overset{?}{\geq} 5$

$= -4\frac{1}{3}$

$|-3(0)-8| \overset{?}{\geq} 5$

$|-8| \geq 5$ ✓

$\left(-\infty, -\frac{13}{3}\right] \cup [-1, +\infty)$

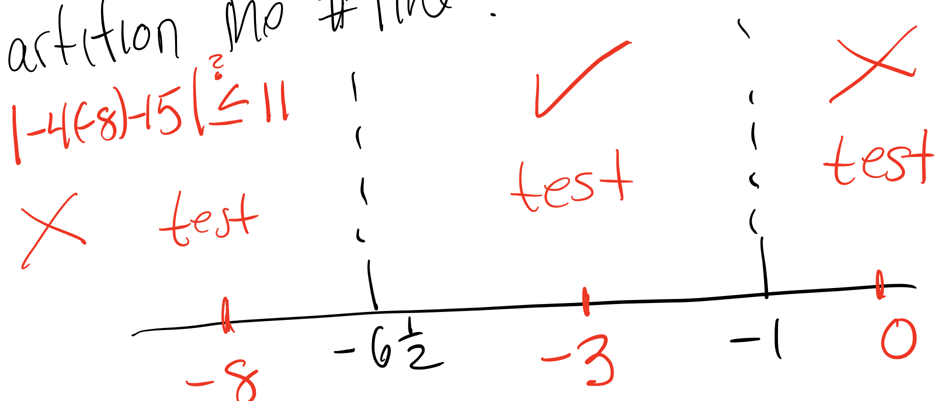
c) $|-4x-15| \leq 11$

1) Solve the equality first: $|-4x-15|=11$

$$
\begin{aligned}
-4x-15 &= 11 \\
+15 \quad & \quad +15 \\
\frac{-4x}{-4} &= \frac{26}{-4} \\
\Aboxed{x &= -\frac{13}{2} = -6\tfrac{1}{2}}
\end{aligned}
$$

$$
\begin{aligned}
-4x-15 &= -11 \\
+15 \quad & \quad +15 \\
\frac{-4x}{-4} &= \frac{4}{-4} \\
\Aboxed{x &= -1}
\end{aligned}
$$

2) Partition the # line: $|-4x-15| \leq 11$



$$\boxed{\left[-\frac{13}{2}, -1\right]}$$

Sample Exam #1

#1) Indicate whether the corresponding equation defines y as a function of x

Strategy → 1) solve for y in terms of x
2) Check That each x value yields only one y-value

1) $x^2 + 2y = 6$
$-x^2 \qquad -x^2$

$\frac{2y}{2} = \frac{6 - x^2}{2}$

$y = 3 - \frac{1}{2}x^2$ ← each input give only one output

⇒ $\boxed{\text{Yes}}$ y is a function of x

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2) $2|x| + y = 4$
$-2|x| \qquad -2|x|$

$y = 4 - 2|x|$ ← $\boxed{\text{yes}}$ each input yields only one output

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3) $2x = y^2$

$y^2 = 2x$

$\sqrt{y^2} = \pm\sqrt{2x}$ → $y = \pm\sqrt{2x}$

no! not a function

does each input yield only one output? No!

4) $8+x=y^3$

$\sqrt[3]{8+x}=y$ ← only get one cube root!

$(8+x)^{1/3}=(y^3)^{1/3}$

$(8+x)^{1/3}=y$ ← check graph

yes

Sample Exam #1

2) Given the function: $f(x)=3+x^2$
calculate the following values

a) $f(x+1)=(x+1)^2+3$

$=(x+1)(x+1)+3$

$=x^2+2x+1+3=\boxed{x^2+2x+4}$

b) $f(x)+f(2)$

$=3+x^2+3+2^2=\boxed{10+x^2}$

#3) $f(x)=2x^2+7x-15$

d) $\dfrac{f(a+h)-f(a)}{h}$

$$= \frac{2(a+h)^2 + 7(a+h) - 15 - (2a^2 + 7a - 15)}{h}$$

$(a+h)(a+h)$

$a^2 + ah + ah + h^2$

$= a^2 + 2ah + h^2$

$$= \frac{2[a^2 + 2ah + h^2] + 7a + 7h - 15 - 2a^2 - 7a + 15}{h}$$

$$= \frac{\cancel{2a^2} + 4ah + 2h^2 + \cancel{7a} + 7h \cancel{- 15} \cancel{- 2a^2} \cancel{- 7a} \cancel{+ 15}}{h}$$

$$= \frac{4ah + 2h^2 + 7h}{h} = \frac{\cancel{h}(4a + 2h + 7)}{\cancel{h}} = 4a + 2h + 7$$