Math 80 Spring 2019 Test 7 practice Test Name:

Please silence your cell phone.

<u>You must show your steps</u>. If you're unsure whether you have enough work, please ask.

Helpful information

$x_{coor} = \frac{-b}{2a}$ Given $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Standard form $y = ax^2 + bx + c$ Vertex form $y = a(x-h)^2 + k$

$\log_a N = \frac{\ln N}{\ln a}$

1. Expand $\ln\left(xy^2\right)$ using the logarithmic rules. Simplify when possible.

$\ln x + \ln y^2 \Rightarrow \ln x + 2\ln y$

2. Expand $\log\left(\frac{a}{\sqrt{b}}\right)$ using the logarithmic rules. Simplify when possible.

$\log a - \log\sqrt{b} \Rightarrow \log a - \log b^{1/2}$

$\Rightarrow \log a - \frac{1}{2}\log b$

3. Expand $\ln\left(\sqrt{\frac{e}{x}}\right)$ using the logarithmic rules. Simplify when possible.

$\ln\left(\frac{e}{x}\right)^{1/2} \Rightarrow \frac{1}{2}\ln\left(\frac{e}{x}\right) \Rightarrow \frac{1}{2}(\ln e - \ln x)$

$\Rightarrow \frac{1}{2}(1 - \ln x) \Rightarrow \frac{1}{2} - \frac{1}{2}\ln x$

4. Expand $\log_4\left(16x^3\right)$ using the logarithmic rules. Simplify when possible.

$\log_4(16) + \log_4 x^3 \Rightarrow 2 + 3\log_4 x$

5. Condense $\log\left(x^2-4\right) - \log(x+2)$ using the logarithmic rules. Simplify when possible.

$\log\left(\frac{x^2-4}{x+2}\right) \Rightarrow \log\left(\frac{(x-2)\cancel{(x+2)}}{\cancel{x+2}}\right) \Rightarrow \log(x-2)$

6. Condense $2\ln x + \ln y + \frac{1}{2}\ln z$ using the logarithmic rules. Simplify when possible.

$\ln x^2 + \ln y + \ln z^{1/2} \Rightarrow \ln x^2 + \ln y + \ln\sqrt{z}$

$\Rightarrow \ln\left(x^2 y\sqrt{z}\right)$

11. Solve $3k-5>4$ and $2(k+1)\le 10$. Express the solution set using a graph and interval notation.

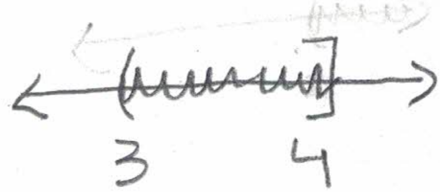
$3k>9$

$k>3$

$2(k+1)\le 10$

$k+1\le 5$

$k\le 4$



$(3,4]$

12. Solve $-6(y-4)\le 24$ or $5y\ge 9y+12$. Express the solution set using a graph and interval notation.

$-6(y-4)\le 24$

$\frac{-6(y-4)}{-6}\ge\frac{24}{-6}$

$y-4\ge -4$

$y\ge 0$

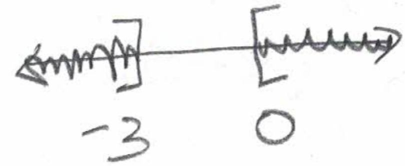
$5y\ge 9y+12$

$-9y \quad -9y$

$-4y\ge 12$

$\frac{-4y}{-4}\le\frac{12}{-4}$

$y\le -3$



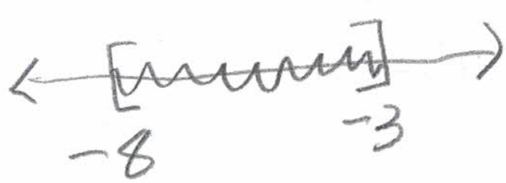
$(-\infty,-3]\cup[0,\infty)$

13. Solve $|2x+11|\le 5$. Express the solution set using a graph and interval notation.

$-5\le 2x+11\le 5$

$-16\le 2x\le -6$

$-8\le x\le -3$



$[-8,-3]$

7. Solve $\log(x+10)=2$

$10^2 = x+10$

$100 = x+10$

$90 = x$

8. Solve $\log_2(x-1)+\log_2(x-3)=3$

$\log_2[(x-1)(x-3)]=3$

$2^3=(x-1)(x-3)$

$8 = x^2-4x+3$

$0 = x^2-4x-5$

$(x-5)(x+1)=0$

$x=5$

$\cancel{x=-1}$

$\boxed{x=5}$

Check

$\log_2(4)+\log_2(2)$

$2+1$

3 ✓

$\cancel{\log_2(-2)}$

9. Solve $|6x+5|=13$

$6x+5=-13$

$6x=-18$

$x=-3$

$6x+5=13$

$6x=8$

$x=\frac{8}{6}=\frac{4}{3}$

Check

$|-18+5|$

$|-13|$

13 ✓

$|6(\frac{4}{3})+5|$

$|8+5|$

$|13|$

13 ✓

10. Solve $1+4|2k-6|=13$

$\frac{4|2k-6|}{4}=\frac{12}{4}$

$|2k-6|=3$

$2k-6=-3$

$2k=3$

$k=3/2$

$2k-6=3$

$2k=9$

$k=\frac{9}{2}$

Check

$1+4|(2(\frac{3}{2})-6|$

$1+4|-3|$

$1+4(3)$

13 ✓

$1+4|2(\frac{9}{2})-6|$

$1+4|3|$

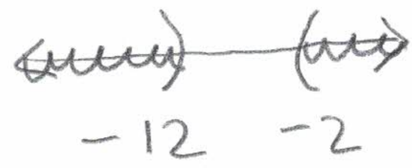
$1+12$

13 ✓

14. Solve $|x+7|+4>9$. Express the solution set using a graph and interval notation.

$-4 \quad -4$

$|x+7|>5$



$-5 < x+7 \qquad x+7>5$

$-12 < x \qquad x>-2$

$(-\infty,-12)\cup(-2,\infty)$

15. Factor, and if possible, reduce. $\dfrac{x^2-5x-14}{xy-3x+2y-6}$.

$$\frac{(x-7)(x+2)}{x(y-3)+2(y-3)} = \frac{(x-7)\cancel{(x+2)}}{\cancel{(x+2)}(y-3)} = \frac{x-7}{y-3}$$

16. Simplify $\dfrac{2x^2+9x+4}{x+4}\times\dfrac{x-5}{4x^2-1}$.

$$\frac{\cancel{(2x+1)}\cancel{(x+4)}(x-5)}{\cancel{(x+4)}(2x-1)\cancel{(2x+1)}} = \frac{x-5}{2x-1}$$

17. Simplify $\dfrac{x^2-4x-5}{x^2-25}\div\dfrac{4x^2-14x}{2x^2+3x-35}$.

$$\frac{(x-5)(x+1)}{(x-5)(x+5)}\cdot\frac{2x^2+3x-35}{4x^2-14x}$$

$$\frac{\cancel{(x-5)}(x+1)}{\cancel{(x-5)}\cancel{(x+5)}}\times\frac{\cancel{(2x-7)}\cancel{(x+5)}}{2x\cancel{(2x-7)}} = \frac{x+1}{2x}$$