

Name (printed legibly):

Solutions

Directions: The quiz contains 20 problems, and each problem is worth one point. Place your answer in the blank provided. For graphing questions, a set of axes are provided. **Calculators are not allowed.**

For this quiz only, no partial credit will be given.

Please circle your instructor: Leah Berman (10:30-11:30) Jill Faudree (9:15-10:15)

1. Evaluate $4^{-3/2}$.

$$4^{-3/2} = \frac{1}{4^{3/2}} = \frac{1}{(\sqrt{4})^3} = \frac{1}{8}$$

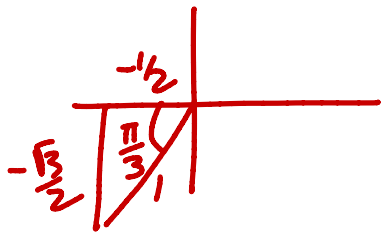
 $\frac{1}{8}$

2. Find the exact value of $\log_3 \frac{1}{27}$.

$$\log_3 \left(\frac{1}{27} \right) = \log_3 3^{-3} = -3$$

 -3

3. Find the exact value of $\sin(4\pi/3)$.



$$\frac{4\pi}{3} = \pi + \frac{\pi}{3}$$

 $-\frac{\sqrt{3}}{2}$

4. Simplify the expression $\left(\frac{4x^3y}{x^5y^{7/2}} \right)^2$. Write your answer without negative exponents.

$$\left(\frac{4}{x^2 y^{5/2}} \right)^2 = \frac{16}{x^4 y^5}$$

 $\frac{16}{x^4 y^5}$

5. Write an equation in slope-intercept form $y = mx + b$ for the line that passes through the points $(-3, 7)$ and $(3, -9)$.

$$m = \frac{7 - (-9)}{-3 - 3} = \frac{16}{-6} = -\frac{8}{3}$$

$$y = -\frac{8}{3}x - 1$$

$$y - (-9) = -\frac{8}{3}(x - 3) = -\frac{8}{3}x + 8$$

$$y = -\frac{8}{3}x - 1$$

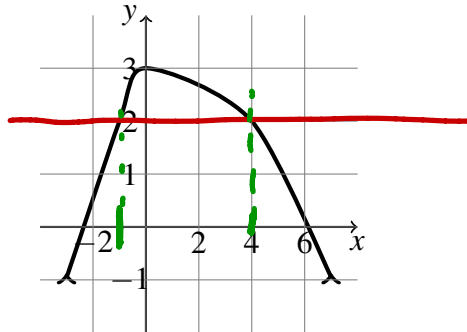
6. Expand and simplify $(5x + 1)^2 - 8(x - 2)$.

$$25x^2 + 10x + 1 - 8x + 16$$

$$= 25x^2 + 2x + 17$$

$$\underline{25x^2 + 2x + 17}$$

7. Use the graph of $f(x)$ below to estimate the value(s) of x such that $f(x) = 2$.



$$\underline{x = -1 \text{ or } x = 4}$$

8. For the function $f(x) = \frac{2}{x}$, find the expression $f(12 + h) - f(12)$. Simplify your answer and write your answer as a single fraction.

$$f(12+h) - f(12)$$

$$= \frac{2}{12+h} - \frac{2}{12} = \frac{2 \cdot 12 - 2(12+h)}{12(12+h)} = \frac{-2h}{12(12+h)} = \frac{-h}{6(12+h)}$$

$$\underline{\frac{-h}{6(12+h)}}$$

9. Given the piecewise defined function below, determine the value(s) of x such that $f(x) = -20$.

$$f(x) = \begin{cases} 2x + 3 & x < 0 \\ x^3 & x \geq 0 \end{cases}$$

$$2x + 3 = -20$$

$$x = -23/2$$

$$x^3 \neq -2$$

for $x \geq 0$

$$\underline{x = -23/2 = -11.5}$$

10. Solve for x in the equation $x^2 + 3x = 10$.

$$x^2 + 3x - 10 = 0$$

$$(x + 5)(x - 2) = 0$$

$$x = -5, 2$$

$$\underline{x = -5 \text{ or } x = 2}$$

11. Solve for x in the equation $e^{4-7x} = \frac{1}{2}$.

$$\ln(e^{4-7x}) = \ln\left(\frac{1}{2}\right)$$

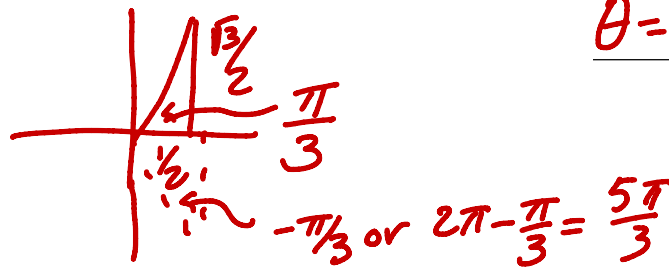
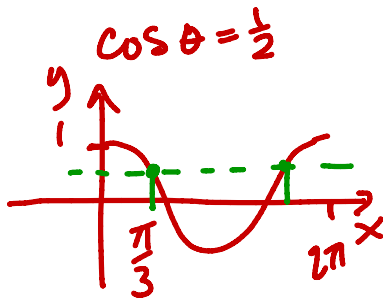
$$4-7x = \ln\left(\frac{1}{2}\right)$$

$$4 - \ln\left(\frac{1}{2}\right) = 7x$$

$$x = \frac{(4 - \ln(\frac{1}{2}))}{7}$$

$$\underline{x = (4 - \ln(\frac{1}{2})) / 7}$$

12. Find all solutions to the equation $2 \cos(\theta) = 1$ in the interval $[0, 2\pi]$.



$$\underline{\theta = \pi/3 \text{ or } \theta = 5\pi/3}$$

13. A table of values for the function $f(x)$ is given below. Use the table to determine $f^{-1}(5)$.

x	-5	0	5	10	15	20	25	30	35
$f(x)$	100	50	25	10	5	2	1	-1	-1/5

$$\underline{15}$$

$f(15) = 5$ means $f^{-1}(5) = 15$

14. Solve the inequality $16 - x^2 \leq 0$. Give your answer in interval notation.

want $16 \leq x^2$

$$\underline{(-\infty, -4] \cup [4, \infty)}$$

So $x \geq 4$ or $x \leq -4$

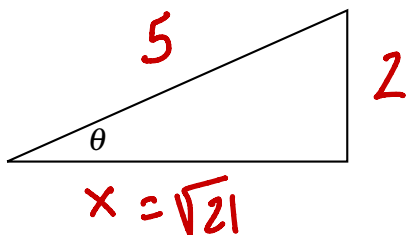
15. Determine the domain of $f(x) = \ln(x - 4)$. Give your answer in interval notation.

want $x - 4 > 0$

$$\underline{(4, \infty)}$$

So $x > 4$

16. In the triangle below, $\sin \theta = \frac{2}{5}$. Determine $\cos \theta$.



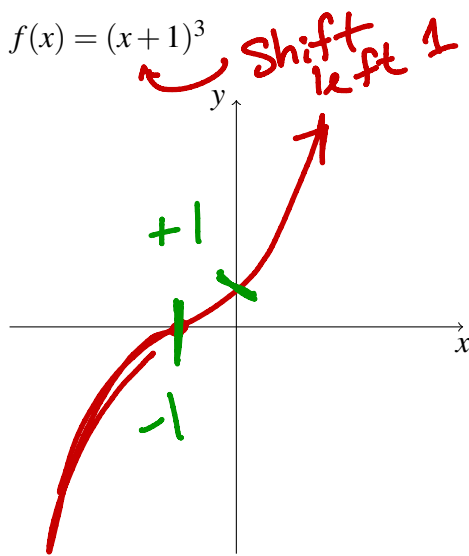
$$x = \sqrt{25 - 4}$$

$$= \sqrt{21}$$

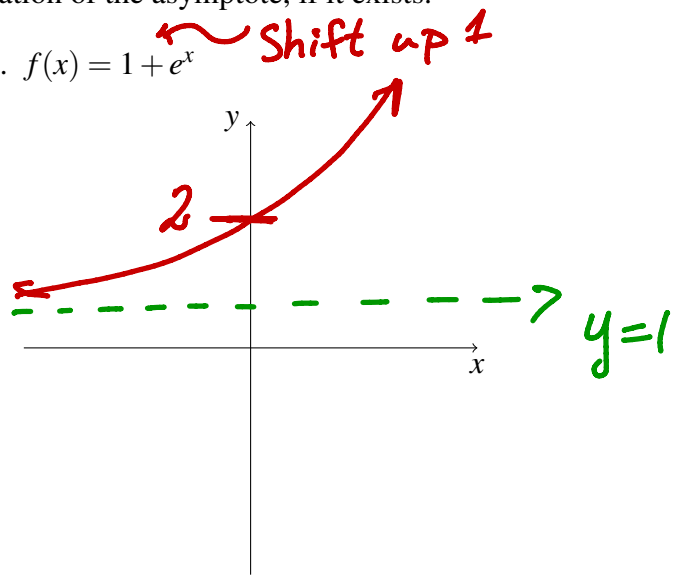
$$\underline{\cos \theta = \sqrt{21} / 5}$$

Sketch graphs of the following functions. Label the x - and y -intercepts, if they exist. Draw in any asymptotes using dashed lines, and write the equation of the asymptote, if it exists.

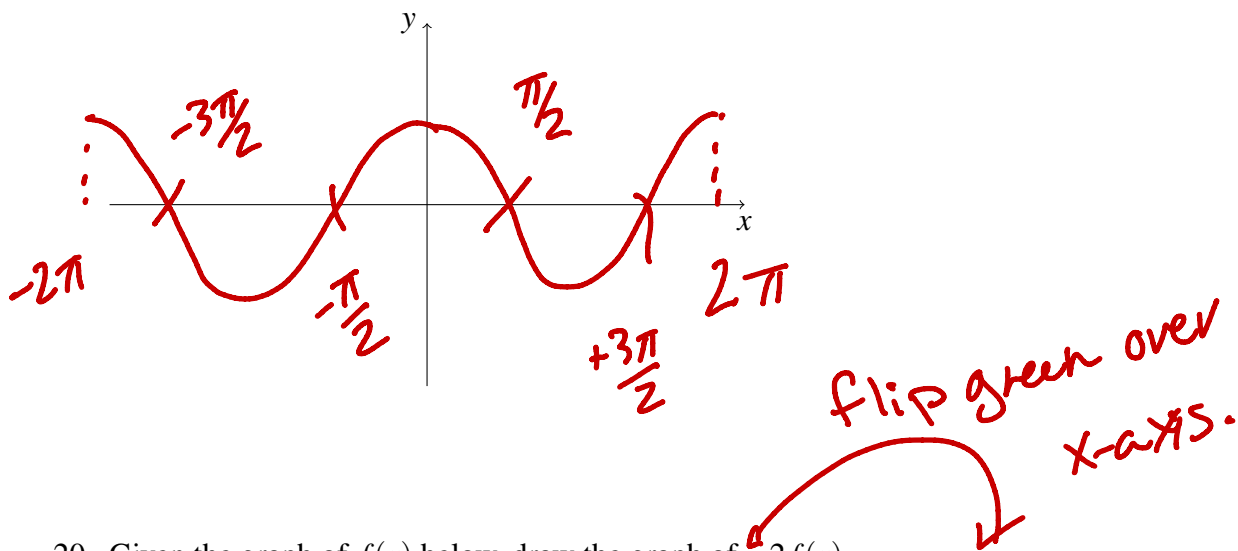
17. $f(x) = (x+1)^3$



18. $f(x) = 1 + e^x$

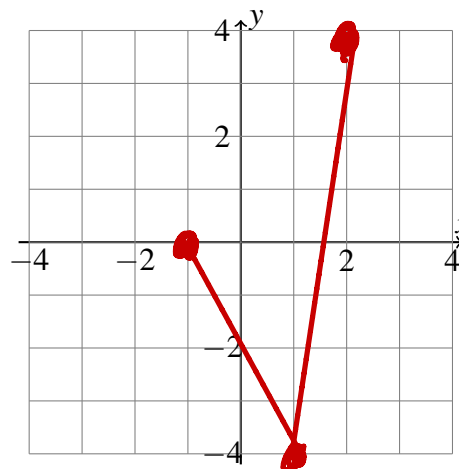
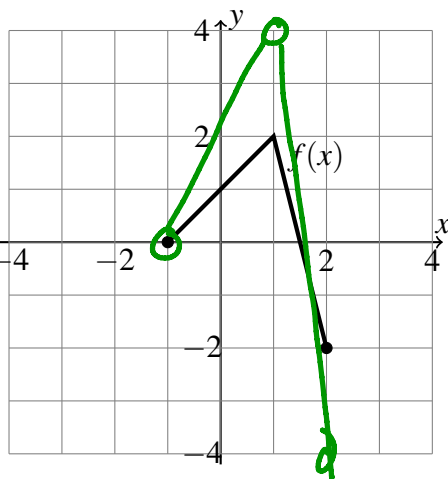


19. $y = \cos(x)$ on the interval $[-2\pi, 2\pi]$



20. Given the graph of $f(x)$ below, draw the graph of $-2f(x)$.

*2f(x)
thinking
here*



*answer
here*