Name_____

Semester Exam Review (A good Mix of Questions)

1. Solve.
   $4(x + 1) + 4x = 5x - 14$

2. Solve and graph.
   $3x + 6 \geq x + 8$

3. Solve.
   $(3x - 4)^2 = 7$

4. Solve.
   $|7x + 1| = x + 7$

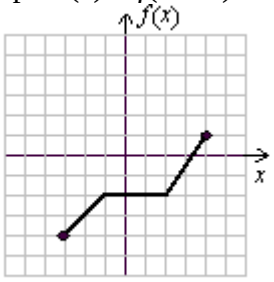
5. Test the equation for symmetry with respect to the x-axis, the y-axis, and the origin. Sketch the graph of the equation.
   $9x^2 - y^2 = 1$

6. Write the equation of a circle with center (0, 0) and radius 9.

7. Write the equation of the line passing through (4, 3) and (3, 3). Write your answer in the slope-intercept form $y = mx + b$.

8. Write an equation of the line passing through (–3, –13) and parallel to $y = 2x + 1$. Write your answer in standard form $Ax + By = C$, $A \geq 0$.

9. Graph $h(x) = f(x + 2)$ and state the domain and range of h.



(*Gridlines represent one unit each.*)

10. Find the vertex and axis of the parabola, then draw the graph.
    $f(x) = 5(x + 10)^2 + 17$

11. Solve the inequality. $x^2 - 4 > -3x$

12. Find the inverse function f^{-1}.

$$f(x) = 3 + \frac{6}{x}$$

13. Graph the function.

$$y = (x - 1)^4$$

14. Compute the quotient and remainder.

$$(x^2 - 7x + 15) \div (x - 4)$$

15. Write the polynomial as a product of linear factors.

$$P(x) = x^3 + 4x^2 - 7x - 10$$

16. Solve the inequality. Write your answer in interval notation.

$$\frac{x-2}{x^2 - 4x - 12} \le 0$$

17. Graph $y = 4e^x$.

18. Simplify.

$$9e^{9x}(e^{-9x} + 2) - 9e^{-9x}(e^{9x} + 2)$$

19. Given that $\log x = 7$ and $\log y = 2$, find $\log\left(\frac{x}{y}\right)$.

20. Solve exactly.

$$\ln(6x + 10) = \ln(4x + 14)$$

21. Convert from degree-minute-second form to decimal degrees to two decimal places.

$$249°30'$$

22. Find the exact value of $\cot\left(-\frac{9\pi}{2}\right)$.

23. Find all zeroes of the function $y = \sin x$ on $[-2\pi, 2\pi]$.

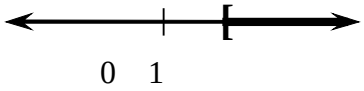
24. Find the period and phase shift and graph the function for $-\pi \le x \le \pi$.

$$y = \cot(2x)$$

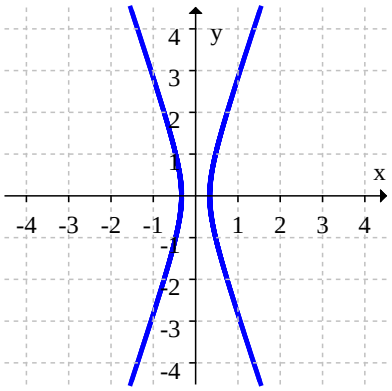
25. Find the exact value.

$$\cos^{-1}\left[\cos\left(\frac{5\pi}{4}\right)\right]$$

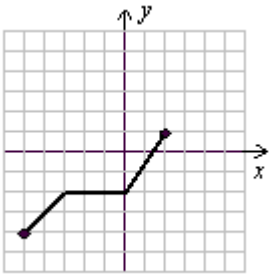
Answer Key

1. –6
2. 

3. $\frac{4 \pm \sqrt{7}}{3}$
4. –1, 1
5. Symmetric with respect to the *x*-axis, *y*-axis, and orig

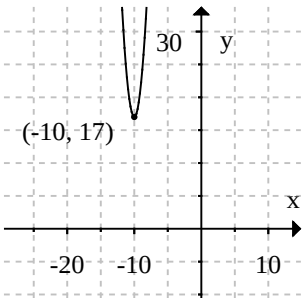


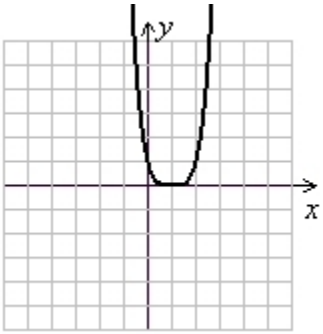
6. $x^2 + y^2 = 81$
7. $y = 3$
8. $2x - y = 7$
9. Domain = [–5, 2], Range = [–4, 1]



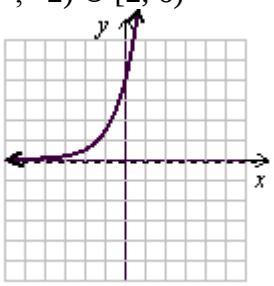
(*Gridlines represent one unit each.*)

10. Vertex: (–10, 17); axis: $x = -10$



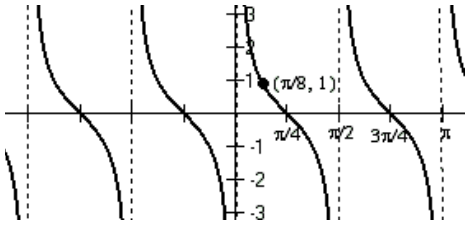
11. $(-\infty, -4) \cup (1, \infty)$
12. $f^{-1}(x) = \frac{6}{x-3}$
13. 

(*Gridlines represent one unit each.*)

14. $x - 3$, $R = 3$
15. $P(x) = (x + 1)(x - 2)(x + 5)$
16. $(-\infty, -2) \cup [2, 6)$
17. 

(*Gridlines represent one unit each.*)

18. $18(e^{9x} - e^{-9x})$
19. 5
20. 2
21. 249.5°
22. 0
23. $-2\pi, -\pi, 0, \pi, 2\pi$
24. Period = $\frac{\pi}{2}$, phase shift = 0



25. $\frac{3\pi}{4}$