

Spring Final Exam Review

Solve each equation. Remember to check for extraneous solutions.

1) $\sqrt{-4 - 2b} = \sqrt{1 - b}$
 $\{-5\}$

2) $5 = \sqrt{1 - 12b}$
 $\{-2\}$

3) $\sqrt{-40 + 14v} = v$
 $\{10, 4\}$

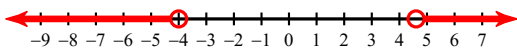
Solve each equation.

4) $|4 - 10x| = 0$ $\left\{\frac{2}{5}\right\}$

5) $|5a + 1| = 46$ $\left\{9, -\frac{47}{5}\right\}$

Solve each inequality and graph its solution.

6) $|3 - 10m| + 9 > 52$



$m < -4$ or $m > \frac{23}{5}$

Simplify each and state the excluded values.

7) $\frac{10a - 60}{a^2 - 4a - 32}$
 $\frac{10(a - 6)}{(a - 8)(a + 4)}$; $\{8, -4\}$

Simplify each expression.

8) $\frac{x + 5}{x + 3} \div \frac{x^2 + 2x - 15}{x^2 - 8x + 15} \cdot \frac{x - 5}{x + 3}$

9) $\frac{p^2 - 14p + 49}{3p} \cdot \frac{1}{p - 7} \cdot \frac{p - 7}{3p}$

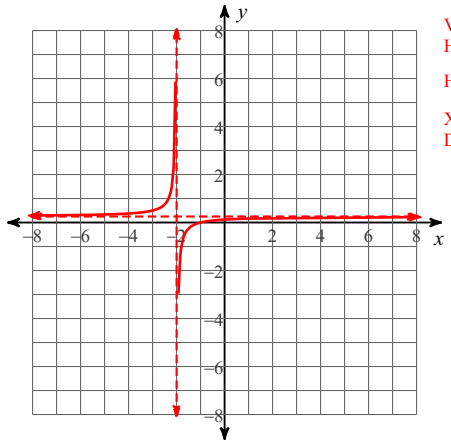
10) $\frac{x + 8}{5x - 5} - \frac{4}{7x}$
 $\frac{7x^2 + 36x + 20}{35x(x - 1)}$

11) $\frac{5}{2m^2} + \frac{m - 5}{7m + 8}$
 $\frac{35m + 40 + 2m^3 - 10m^2}{2m^2(7m + 8)}$

12) $\frac{\frac{3x - 1}{4}}{\frac{3x - 1}{x^2} + \frac{3x - 1}{4}} \cdot \frac{x^2}{x^2 + 4}$

Identify the holes, vertical asymptotes, x-intercepts, horizontal asymptote, and domain of each. Then sketch the graph.

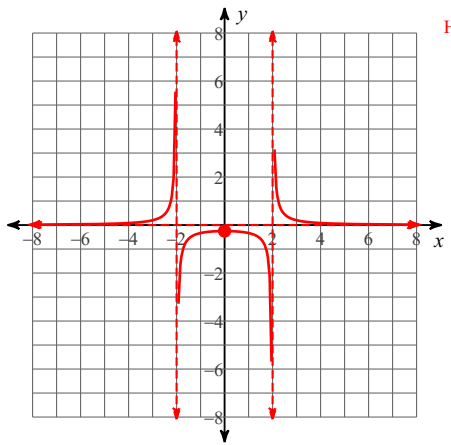
13) $f(x) = \frac{x + 1}{4x + 8}$



Vertical Asym.: $x = -2$
 Holes: None
 Horz. Asym.: $y = \frac{1}{4}$
 X-intercepts: -1
 Domain:
 All reals except -2

Identify the holes of each. Then sketch the graph.

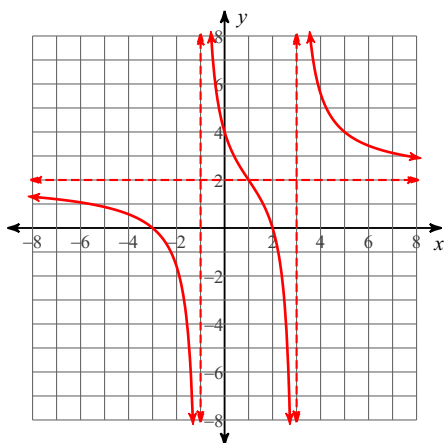
14) $f(x) = \frac{x}{x^3 - 4x}$



Holes: $x = 0$

Graph each function.

$$15) f(x) = \frac{2x^2 + 2x - 12}{x^2 - 2x - 3}$$



Simplify.

$$16) (n^8)^{-\frac{3}{4}} \frac{1}{n^6}$$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

$$17) 4x \cdot 2x^{\frac{1}{3}} y^{\frac{1}{3}} \quad 8x^{\frac{4}{3}} y^{\frac{1}{3}}$$

$$18) u^{\frac{1}{2}} v^{-\frac{3}{2}} \cdot 3u \frac{3v^{\frac{1}{2}} u^{\frac{3}{2}}}{v^2}$$

Write each expression in radical form.

$$19) 10^{\frac{6}{5}}$$

$$(\sqrt[5]{10})^6$$

Find the inverse of each function.

$$20) y = 10^x - 10$$

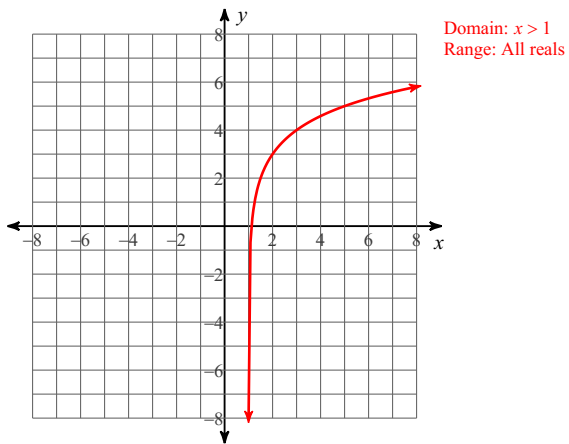
$$y = \log(x + 10)$$

$$21) y = \log_3(-4x)$$

$$y = -\frac{3^x}{4}$$

Identify the domain and range of each. Then sketch the graph.

22) $y = \log_2 (x - 1) + 3$



Identify the domain and range of each.

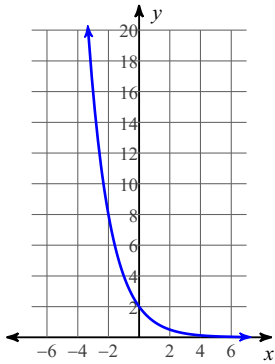
23) $y = \ln (x - 2) + 2$

Domain: $x > 2$
Range: All reals

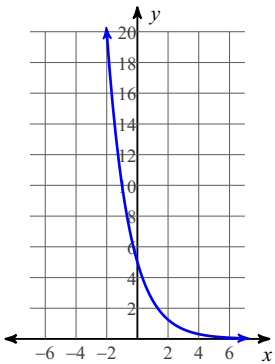
Sketch the graph of each function.

24) $y = \frac{1}{3} \cdot \left(\frac{1}{7}\right)^x$

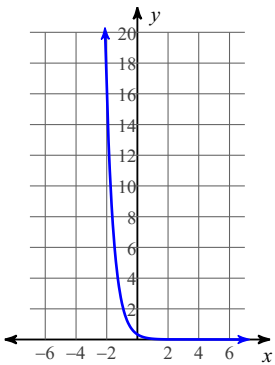
A)



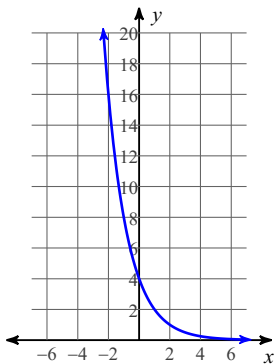
B)



*C)



D)



Solve each equation.

25) $\log_5 10 + \log_5 (x + 4) = 2$ $\left\{ -\frac{3}{2} \right\}$

26) $\log_7 4 - \log_7 4x = 1$ $\left\{ \frac{1}{7} \right\}$

$$27) \log_5 3 - \log_5 (x - 10) = 1 \quad \left\{ \frac{53}{5} \right\}$$

$$28) \log_2 (x - 4) - \log_2 7 = 3$$
$$\{60\}$$

$$29) 2^{2v} = 2^{-v}$$
$$\{0\}$$

Solve each equation. Round your answers to the nearest ten-thousandth.

$$30) 3^{k+9} - 7 = 84$$
$$-4.894$$

Evaluate each expression.

$$31) \log_4 \frac{1}{16}$$
$$-2$$

32) If you deposit \$5,000 into a bank account which earns 4.25% compounded continuously, how long will it take for your money to triple?

$$25.85 \text{ years}$$

33) If your boat depreciates at a rate of 5% each year, how much is it worth in 6 years if the initial value of your boat was \$16,000?

$$\$11,761.47$$