Integrated Math Name_____ ID: 1

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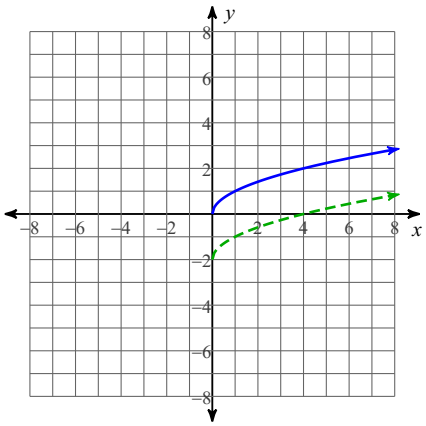
Summer Work

Date_____ Period____

Write $g(x)$ (dashed line) in terms of $f(x)$ (solid line).

1)



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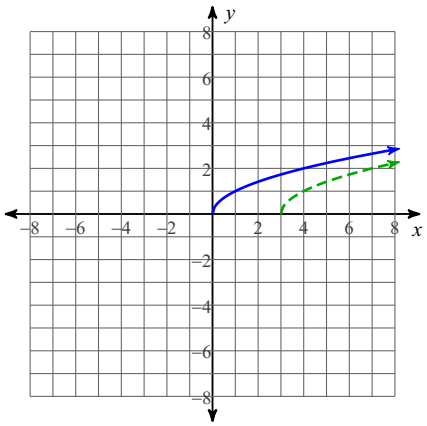

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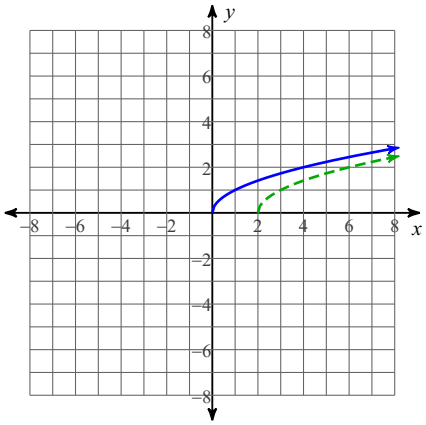

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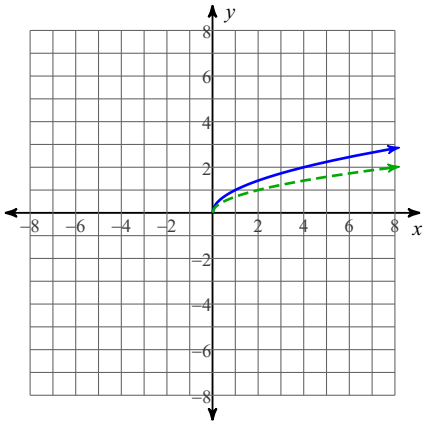

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Describe the transformations necessary to transform the graph of $f(x)$ into that of $g(x)$.

5) $f(x) = x^3$
$g(x) = -x^3 + 1$

6) $f(x) = \frac{1}{x}$
$g(x) = -\frac{1}{x} + 3$

7) $f(x) = |x|$
$g(x) = \left|\frac{1}{3}x\right| + 1$

8) $f(x) = x^2$
$g(x) = (x + 3)^2 - 3$

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Transform the given function $f(x)$ as described and write the resulting function as an equation.

9) $f(x) = \sqrt{x}$
compress horizontally by a factor of 3
reflect across the y-axis
reflect across the x-axis
translate right 2 units
translate up 1 unit

10) $f(x) = |x|$
expand vertically by a factor of 3
reflect across the x-axis
translate right 1 unit
translate down 2 units

11) $f(x) = \frac{1}{x}$
compress horizontally by a factor of 3
reflect across the x-axis
translate right 3 units
translate down 1 unit

12) $f(x) = \sqrt{x}$
expand horizontally by a factor of 3
reflect across the y-axis
reflect across the x-axis
translate left 2 units
translate down 2 units

Sketch the graph of each function.

13) $g(x) = -\left(\frac{1}{3}(x-2)\right)^2 - 2$

14) $g(x) = -\frac{2}{x+2} + 3$

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15) $g(x) = -\left|2(x+3)\right| + 3$

16) $g(x) = -(3(x+1))^3 + 3$

Solve each equation.

17) $2^{-2a} = 2^{-2a}$

18) $27^{-2b-3} = 9^{-3b-3}$

19) $5^{-2r-2} \cdot 5^{-2r} = 125$

20) $\frac{1}{216} \cdot 36^{3a} = 216$

21) $64^{-3k} \cdot 16^{-3k} = 4^3$

22) $25^{-3b} \cdot 25^{-3b} = 625^{-2b}$

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23) $e^{k+1} + 7 = 41$

24) $-e^{b+2} = -71$

25) $-7e^{-9n} = -5$

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

26) $3e^{6-r} + 7.2 = 12$

27) $5.8e^{-0.3x-7.6} - 2 = 66$

28) $4e^{8m-7} - 1 = 75$

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Solve each equation.

29) $\log_6 x - \log_6 (x - 4) = 1$

30) $\log 2 - \log -x = \log 5$

31) $\log_8 4 + \log_8 (x + 4) = 3$

32) $\log_4 3 - \log_4 (x - 2) = 3$

33) $\log_4 6 - \log_4 (x + 5) = 2$

34) $\log_2 (x + 9) + \log_2 6 = 1$

35) $\log_5 4x^2 + \log_5 3 = \log_5 27$

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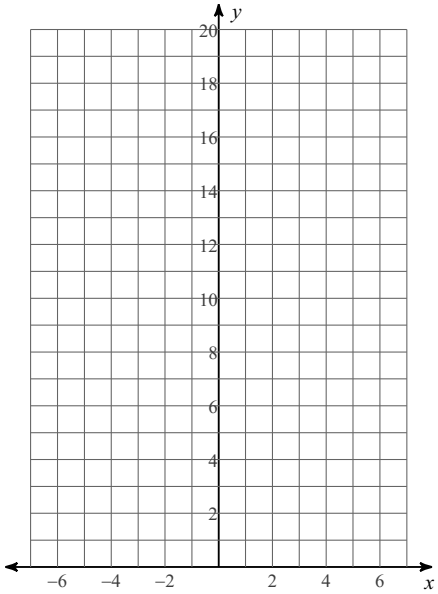
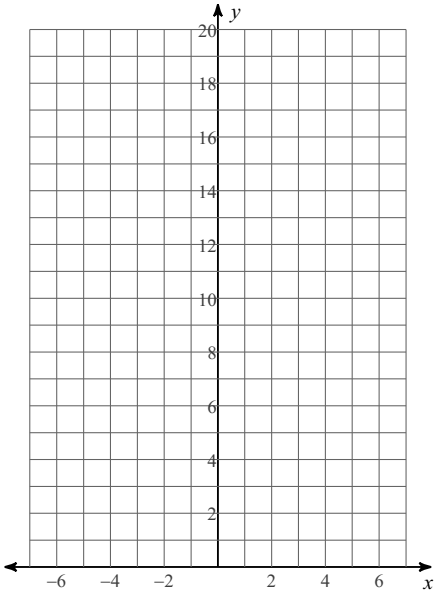
Sketch the graph of each function.

36) $y = \frac{1}{3} \cdot 5^x$



37) $y = \frac{1}{3} \cdot 7^x$



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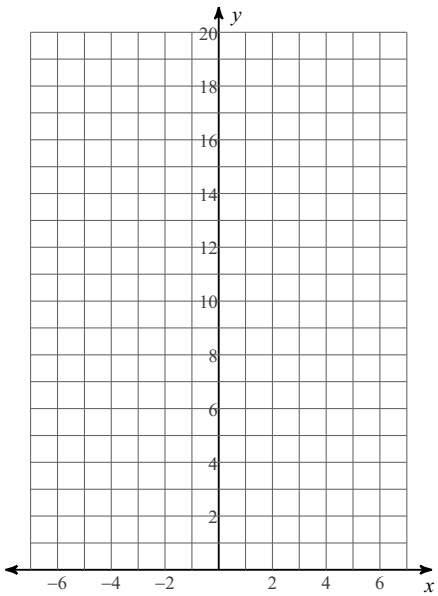
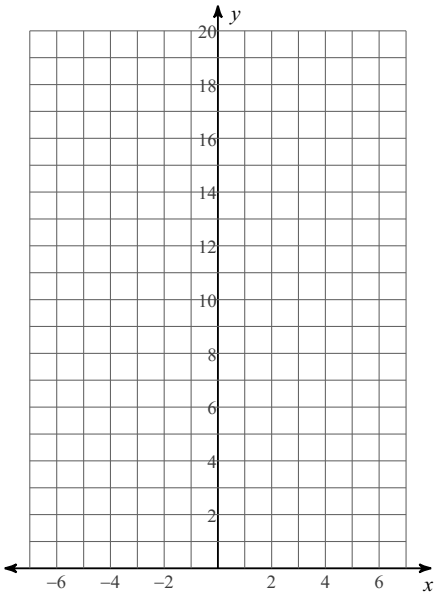
38) $y = \frac{1}{4}e^{x}$



39) $y = 5 \cdot 2^{x}$



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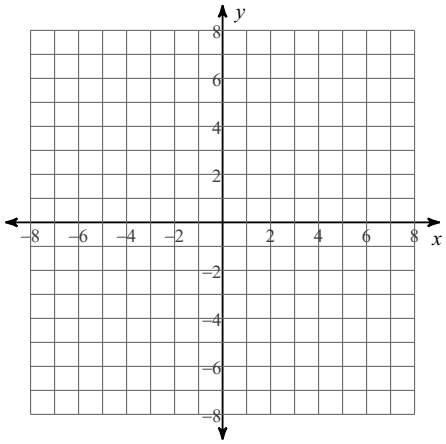
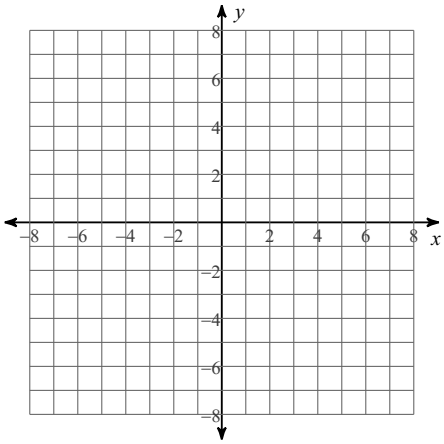
Sketch the graph of each function using endbehaviour.

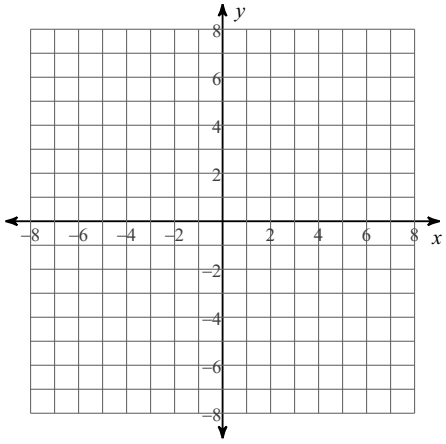
40) $f(x) = x^4 + x^3 - 3x^2 - 2$



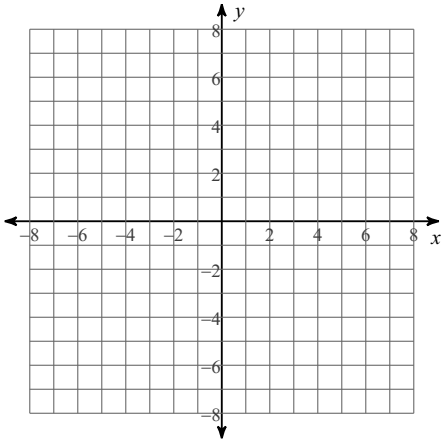
41) $f(x) = x^5 - 4x^3 + 2x + 1$



42) $f(x) = x^2 - 4x - 1$



43) $f(x) = x^5 - 4x^3 + 4x$



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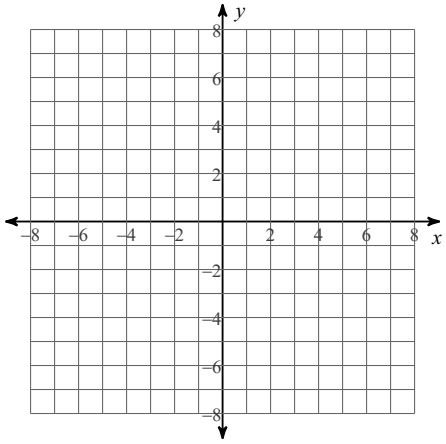
For each function, identify the holes, intercepts, and horizontal asymptote. Then sketch the graph.

44) $f(x) = \dfrac{4}{x+1} - 1$



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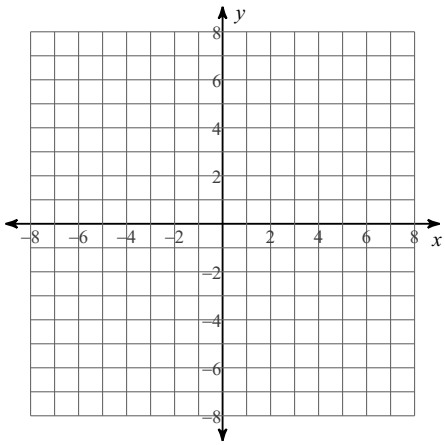
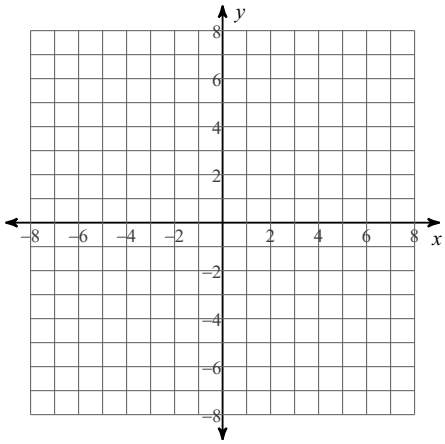
45) $f(x) = \dfrac{1}{x-4} - 1$



46) $f(x) = \dfrac{3}{x} - 2$



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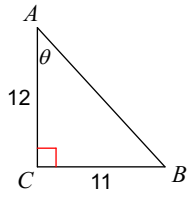
Find the measure of each angle indicated. Round to the nearest tenth.

47)



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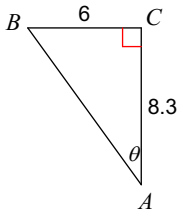
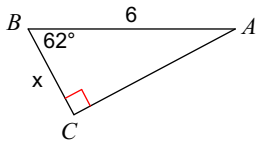


Find the measure of each side indicated. Round to the nearest tenth.

49)



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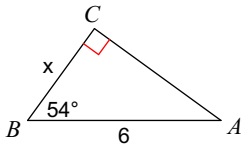

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Answers to Summer Work (ID: 1)

1) $g(x) = f(x) - 2$

2) $g(x) = f(x - 3)$

3) $g(x) = f(x - 2)$

4) $g(x) = f\left(\frac{1}{2}x\right)$

5) reflect across the x-axis
translate up 1 unit

6) reflect across the x-axis
translate up 3 units

7) expand horizontally by a factor of 3
translate up 1 unit

8) translate left 3 units
translate down 3 units

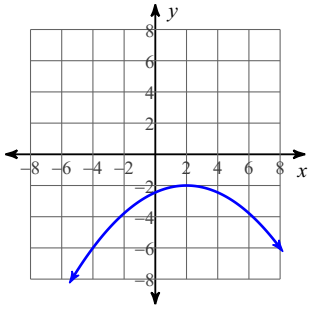
9) $g(x) = -\sqrt{-3(x - 2)} + 1$

10) $g(x) = -3\left|x - 1\right| - 2$

11) $g(x) = -\frac{1}{3(x - 3)} - 1$

12) $g(x) = -\sqrt{-\frac{1}{3}(x + 2)} - 2$

13)



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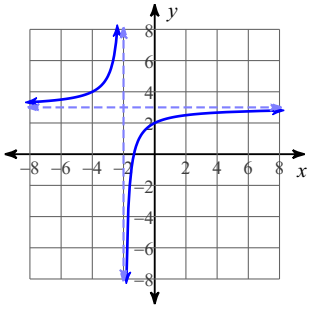

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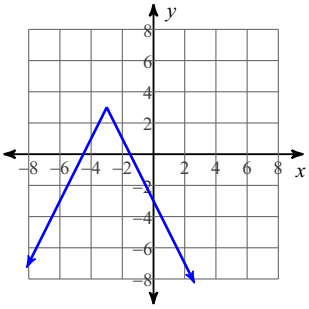

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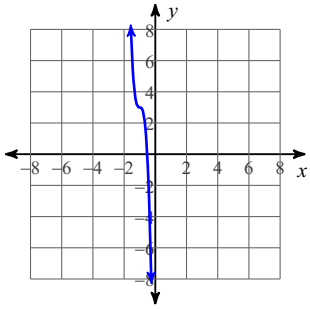


17) { All real numbers. }

18) No solution.

19) $\left\{-\frac{5}{4}\right\}$

20) $\{1\}$

21) $\left\{-\frac{1}{5}\right\}$

22) $\{0\}$

23) $\ln 34 - 1$

24) $\ln 71 - 2$

25) $-\frac{\ln \frac{5}{7}}{9}$

26) 5.53

27) -33.5388

28) 1.2431

29) $\left\{\frac{24}{5}\right\}$

30) $\left\{-\frac{2}{5}\right\}$

31) $\{124\}$

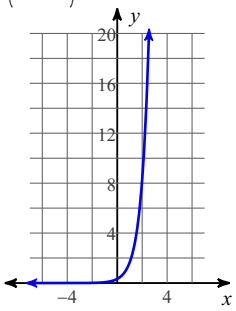
32) $\left\{\frac{131}{64}\right\}$

33) $\left\{-\frac{37}{8}\right\}$

34) $\left\{-\frac{26}{3}\right\}$

35) $\left\{\frac{3}{2}, -\frac{3}{2}\right\}$

36)



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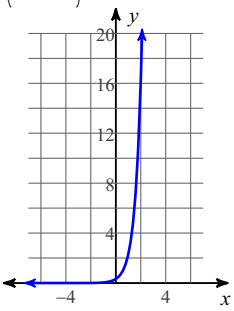

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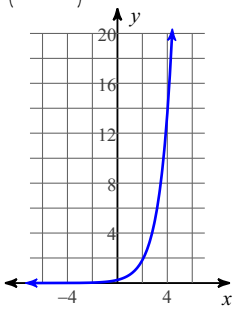

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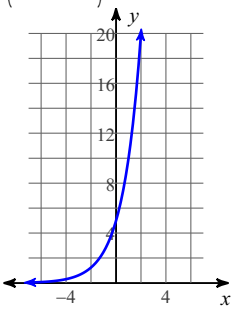

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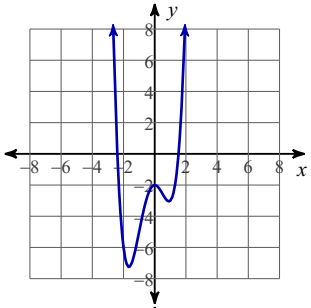
40)



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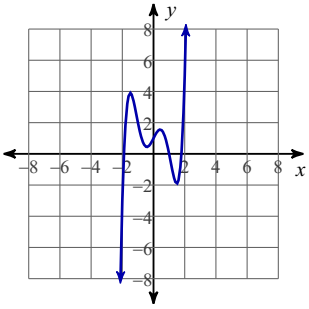

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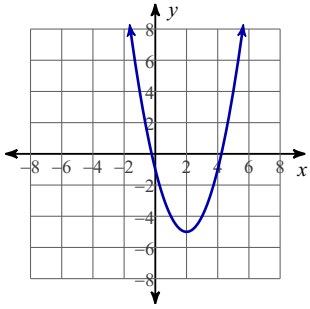

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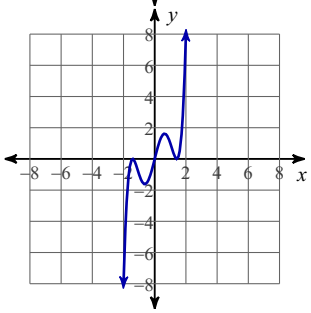

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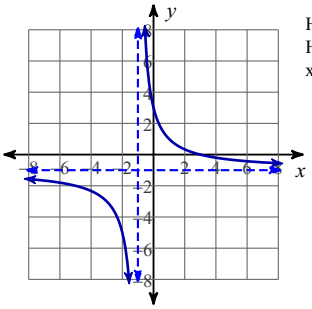
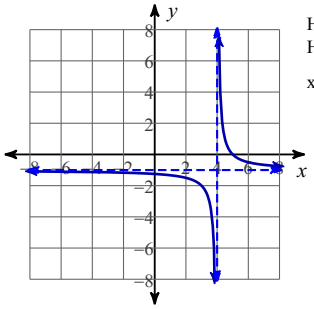


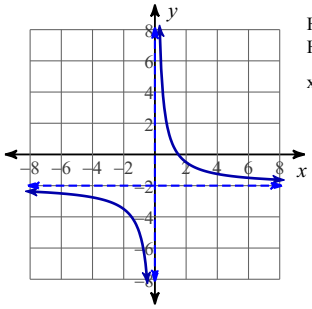
Holes: None
Horz. Asym.: $y = -1$
x-intercepts: 3, y-intercept: 3

45)



Holes: None
Horz. Asym.: $y = -1$
x-intercepts: 5, y-intercept: $-\frac{5}{4}$

46)



Holes: None
Horz. Asym.: $y = -2$
x-intercepts: $\frac{3}{2}$, y-intercept: None

47) 42.5°

48) 35.9°

49) 2.8

50) 3.5

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