Honors Pre Calculus Summer Assignment

Find the zeros of each quadratic function shown below. You may use factoring, the method of completing the square, or the quadratic formula.

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

2) $f(x) = 3x^2 + 5x + 3$

3) $f(x) = 2x^2 - 10x + 11$

4) $f(x) = 3x^2 - 8x + 5$

Find all the zeros of the cubic function shown below. Each function has at least one zero that is an integer between -3 and +3 Determine that zero, then use synthetic division and quadratic techniques to determine the other zeros.

5) $f(x) = x^3 - 4x^2 - 11x$

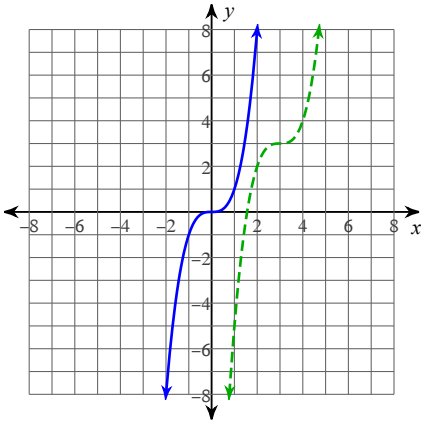
6) $f(x) = 5x^3 + 31x^2 + 31x + 5$

7) $f(x) = 2x^3 - 5x^2 + x + 2$

8) $f(x) = x^3 - 5x^2 + 17x - 33$

Describe the transformations necessary to transform the graph of $f(x)$ (solid line) into that of $g(x)$ (dashed line). In each case, f(x) is a "parent" function. See if you can write the equation of the transformed function g(x)

9)



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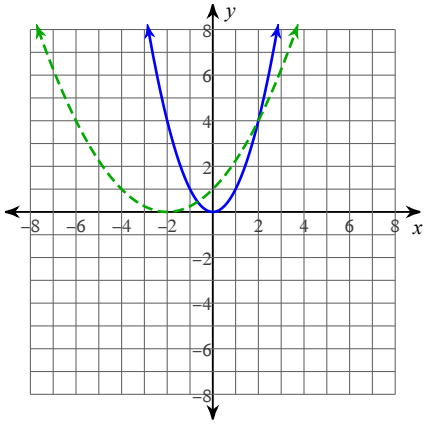

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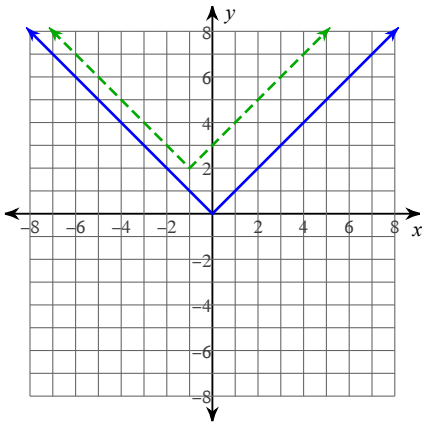

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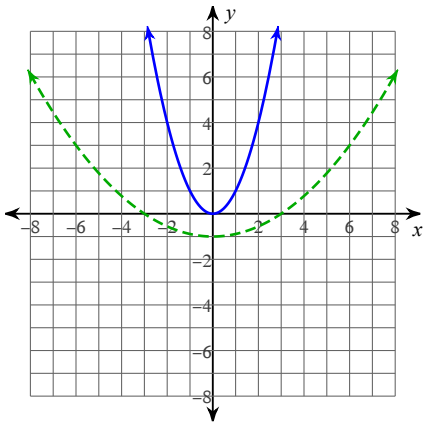


For each function, state the maximum number of turns the graph could make and describe the end behavior. Describe the end behavior in terms of what does the value of the function approach as x approaches either + infinity or - infinity.

13) $f(x) = x^3 - 2x^2 - 4$

14) $f(x) = x^4 - 2x^2 - 2x - 4$

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

16) $f(x) = -x^2 - 6x - 8$

Write the new function indicated by the composition.

17) $f(x) = 2x - 2$
$g(x) = x^2 - x$
Find $(f \circ g)(x)$

18) $g(x) = 3x + 5$
$h(x) = x^2 + 4 - 2x$
Find $(g \circ h)(x)$

Find the value of the composite function when evaluated at the indicated value.

19) $f(x) = -3x - 3$
Find $(f \circ f)(-3)$

20) $g(x) = -3x + 5$
$h(x) = x^3 - 1$
Find $(g \circ h)(-4)$

Solve the exponential equations by changing the base and applying the properties of exponents.

21) $\dfrac{36^{-3x+3}}{\frac{1}{6}} = 36$

22) $16 \cdot 16^{2k+3} = \dfrac{1}{4}$

23) $81^{2x} \cdot 27^{2x-2} = 243$

24) $\dfrac{9^{2n}}{81^{-n}} = 81$

Expand each logarithm using the properties of logarithms.

25) $\log_8 \left(z^2 \sqrt[3]{x}\right)$

26) $\log \left(\frac{x^4}{y}\right)^5$

Condense each expression to a single logarithm, using the properties of logarithms.

27) $3\log_9 7 - 6\log_9 6$

28) $4\log_6 z + \frac{\log_6 x}{2}$

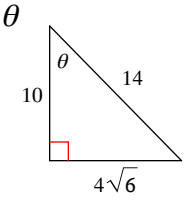
Solve each equation.

29) $\log_9 (x - 6) + \log_9 8 = \log_9 61$

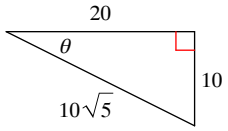
30) $\log_4 8 + \log_4 -2x = 5$

Find the value of the trig function indicated.

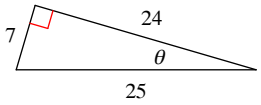
31) sin θ



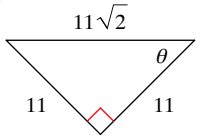
32) cos θ



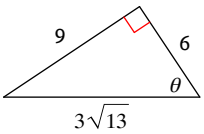
33) tan θ



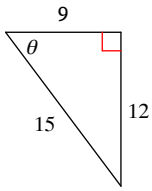
34) cos θ



35) sin θ

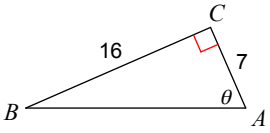


36) tan θ



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

37)



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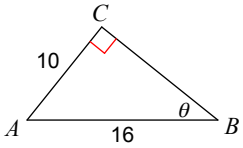

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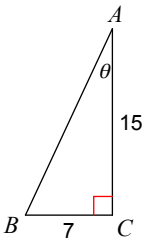

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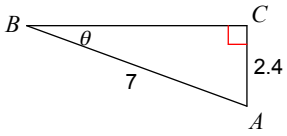


Convert each degree measure into radians and each radian measure into degrees.

41) 100°

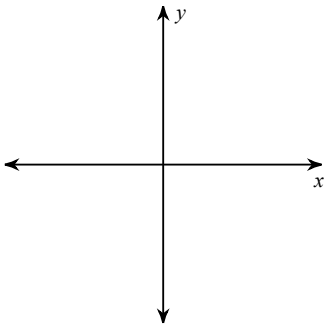
42) 150°

43) $\frac{16\pi}{9}$

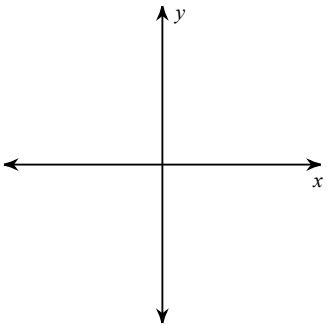
44) 300°

Draw an angle with the given measure in standard position, and state the measure of the reference angle.

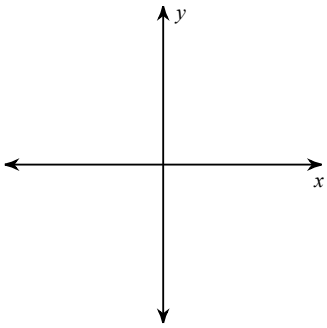
45) 305°



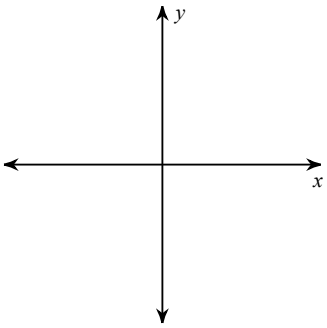
46) −190°



47) $\frac{7\pi}{6}$



48) $-\frac{11\pi}{6}$



Answers to Honors Pre Calculus Summer Assignment

1) $\left\{\frac{1}{3}, -1\right\}$

2) $\left\{\frac{-5 + i\sqrt{11}}{6}, \frac{-5 - i\sqrt{11}}{6}\right\}$

3) $\left\{\frac{5 + \sqrt{3}}{2}, \frac{5 - \sqrt{3}}{2}\right\}$

4) $\left\{\frac{5}{3}, 1\right\}$

5) $\left\{0, 2 + \sqrt{15}, 2 - \sqrt{15}\right\}$

6) $\left\{-\frac{1}{5}, -1, -5\right\}$

7) $\left\{2, -\frac{1}{2}, 1\right\}$

8) $\left\{3, 1 + i\sqrt{10}, 1 - i\sqrt{10}\right\}$

9) translate right 3 units
translate up 3 units

10) expand horizontally by a factor of 2
translate left 2 units

11) translate left 1 unit
translate up 2 units

12) expand horizontally by a factor of 3
translate down 1 unit

13) Max # turns: 2
End behavior:
$\lim_{x \to -\infty} f(x) = -\infty$
$\lim_{x \to \infty} f(x) = \infty$

14) Max # turns: 3
End behavior:
$\lim_{x \to -\infty} f(x) = \infty$
$\lim_{x \to \infty} f(x) = \infty$

15) Max # turns: 4
End behavior:
$\lim_{x \to -\infty} f(x) = \infty$
$\lim_{x \to \infty} f(x) = -\infty$

16) Max # turns: 1
End behavior:
$\lim_{x \to -\infty} f(x) = -\infty$
$\lim_{x \to \infty} f(x) = -\infty$

17) $2x^2 - 2x - 2$

18) $3x^2 - 6x + 17$

19) -21

20) 200

21) $\left\{\frac{5}{6}\right\}$

22) $\left\{-\frac{9}{4}\right\}$

23) $\left\{\frac{11}{14}\right\}$

24) $\left\{\frac{1}{2}\right\}$

25) $2\log_8 z + \frac{\log_8 x}{3}$

26) $20\log x - 5\log y$

27) $\log_9 \frac{7^3}{6^6}$

28) $\log_6 \left(z^4\sqrt{x}\right)$

29) $\left\{\frac{109}{8}\right\}$

30) $\{-64\}$

31) $\frac{2\sqrt{6}}{7}$

32) $\frac{2\sqrt{5}}{5}$

33) $\frac{7}{24}$

34) $\frac{\sqrt{2}}{2}$

35) $\frac{3\sqrt{13}}{13}$

36) $\frac{4}{3}$

37) $66.4°$

38) $38.7°$

39) $25°$

40) $20.1°$

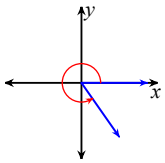
41) $\frac{5\pi}{9}$

42) $\frac{5\pi}{6}$

43) $320°$

44) $\frac{5\pi}{3}$

45)



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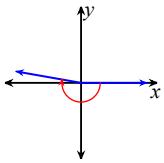

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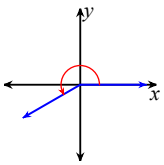

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