

Circuit Training - Asymptotes

KEY

Name: _____

Directions: Begin in cell #1. Read the question and do the work necessary to answer it. Circle your answer then search for it. When you find it, call this cell #2 and proceed in this manner until you complete the circuit by returning to the beginning.

<p>Answer: $y = \frac{3}{\pi}$</p> <p># <u>1</u> Find the equation(s) of the vertical asymptotes for the graph of $y = \frac{x-2}{x-3}$.</p>	<p>Answer: $-\frac{5}{2}$</p> <p># <u>11</u> Find the zero(s) of $f(x) = \frac{x^2-3x+2}{x+2}$.</p>
<p>Answer: $x = -3$</p> <p># <u>19</u> The graph of $y = \tan x$ has infinitely many vertical asymptotes. One of these is...</p>	<p>Answer: $x = 2, x = -2$</p> <p># <u>4</u> The graph of $f(x) = \frac{x-2}{x^2-4}$ has two places of discontinuity but only one vertical asymptote. Find the equation of the vertical asymptote.</p>
<p>Answer: $x = 3$</p> <p># <u>2</u> Find the equation(s) of the vertical asymptotes for the graph of $y = \frac{x-5}{2x+3}$.</p>	<p>Answer: $y = 0$</p> <p># <u>8</u> Find all of the asymptotes for $p(x) = \frac{2x^2+5}{x^2-2x}$.</p>
<p>Answer: $y = x - 5$</p> <p># <u>17</u> Write the equation of the asymptote for the graph of $y = -3 + e^x$.</p>	<p>Answer: $-\frac{1}{2}$</p> <p># <u>14</u> Find all of the asymptotes for $y = \frac{3x^2}{x^2+9}$.</p>
<p>Answer: $x = \frac{\pi}{2}$</p> <p># <u>20</u> The graph of $y = \frac{3}{\pi+2e^x}$ has two horizontal asymptotes. One is $y = 0$. The other is...</p>	<p>Answer: $-\frac{1}{4}$</p> <p># <u>10</u> Find the value of "a" so that the horizontal asymptote of $y = \frac{ax-3}{5x+2}$ is $y = -\frac{1}{2}$.</p>

<p>Answer: $x = -\frac{3}{2}$</p> <p># <u>3</u> Find the equation(s) of the vertical asymptotes for the graph of $y = \frac{2x+1}{x^2-4}$.</p>	<p>Answer: $x = 0, y = x$</p> <p># <u>16</u> Find the equation for the slant asymptote to the graph of $f(x) = \frac{x^2-3x-4}{x+2}$.</p>
<p>Answer: $x = -2$</p> <p># <u>5</u> Find the equation of the horizontal asymptote for the graph of $g(x) = \frac{x-2}{x-3}$.</p>	<p>Answer: -1</p> <p># <u>13</u> The function $f(x) = \frac{2x^2-7x+6}{2x-3}$ has a removable discontinuity (a "hole") at $x = \frac{3}{2}$. What is the y-coordinate of the "hole"?</p>
<p>Answer: $y = \frac{1}{2}$</p> <p># <u>7</u> The functions $f(x) = \frac{2x+1}{x^2-4}$ and $g(x) = \frac{5}{x+6}$ have the same horizontal asymptote. What is its equation?</p>	<p>Answer: $y = -3$</p> <p># <u>18</u> Write the equation of the asymptote to the graph of $y = \ln(3+x)$.</p>
<p>Answer: $1, 2$</p> <p># <u>12</u> Find the zero(s) of $g(x) = \frac{x^2-x-2}{x-2}$.</p>	<p>Answer: $x = 0, x = 2, y = 2$</p> <p># <u>9</u> Find the y-intercept $(0, ?)$ for the graph of $y = \frac{2x+1}{x^2-4}$.</p>
<p>Answer: $y = 3$</p> <p># <u>15</u> Find the asymptotes for $y = x + \frac{1}{x}$.</p>	<p>Answer: $y = 1$</p> <p># <u>6</u> Find the equation of the horizontal asymptote to the graph of $f(x) = \frac{x-5}{2x+3}$.</p>

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Directions: Begin in cell #1. Read the question and do the work necessary to answer it. Circle your answer then search for it. When you find it, call this cell #2 and proceed in this manner until you complete the circuit by returning to the beginning.

<p>Answer: $y = \frac{3}{\pi}$</p> <p># <u>1</u> Find the equation(s) of the vertical asymptotes for the graph of $y = \frac{x-2}{x-3}$.</p> <p>$x-3=0$ $x=3$</p>	<p>Answer: $-\frac{5}{2}$</p> <p># <u>11</u> Find the zero(s) of $f(x) = \frac{x^2-3x+2}{x+2}$.</p> <p>$f(x)=0$ solve $x^2-3x+2=0$ $(x-2)(x-1)=0$ $x=2, x=1$</p>
<p>Answer: $x = -3$</p> <p># <u>19</u> The graph of $y = \tan x$ has infinitely many vertical asymptotes. One of these is...</p> <p>$\tan x = \frac{\sin x}{\cos x}$ $\cos x \neq 0$ $x = \frac{\pi}{2}, \frac{3\pi}{2}, \dots$</p>	<p>Answer: $x = 2, x = -2$</p> <p># <u>4</u> The graph of $f(x) = \frac{x-2}{x^2-4}$ has two places of discontinuity but only one vertical asymptote. Find the equation of the vertical asymptote.</p> <p>$x=2$ $(x-2)(x+2)$ hole $x=2$ V.A. $x+2=0$ $x=-2$</p>
<p>Answer: $x = 3$</p> <p># <u>2</u> Find the equation(s) of the vertical asymptotes for the graph of $y = \frac{x-5}{2x+3}$.</p> <p>$2x+3=0$ $x = -\frac{3}{2}$</p>	<p>Answer: $y = 0$</p> <p># <u>8</u> Find all of the asymptotes for $p(x) = \frac{2x^2+5}{x^2-2x}$.</p> <p>degrees match lead lead $y=2$ $x=0$ $x=2$</p>
<p>Answer: $y = x - 5$</p> <p># <u>17</u> Write the equation of the asymptote for the graph of $y = -3 + e^x$.</p> <p>$y = -3$ shifted down 3</p>	<p>Answer: $-\frac{1}{2}$</p> <p># <u>14</u> Find all of the asymptotes for $y = \frac{3x^2}{x^2+9}$.</p> <p>$y=3$ degrees match no real zeros in denominator</p>
<p>Answer: $x = \frac{\pi}{2}$</p> <p># <u>20</u> The graph of $y = \frac{3}{\pi+2e^x}$ has two horizontal asymptotes. One is $y = 0$. The other is...</p> <p>$y = \frac{3}{\pi}$ horizontal asymptote</p>	<p>Answer: $-\frac{1}{4}$</p> <p># <u>10</u> Find the value of "a" so that the horizontal asymptote of $y = \frac{ax-3}{5x+2}$ is $y = -\frac{1}{2}$.</p> <p>degrees match lead lead $\frac{a}{5} = -\frac{1}{2}$ $a = -\frac{5}{2}$</p>

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$a = -\frac{5}{2}$

<p>Answer: $x = -\frac{3}{2}$</p> <p># <u>3</u> Find the equation(s) of the vertical asymptotes for the graph of $y = \frac{2x+1}{x^2-4}$.</p> <p>$x^2-4=0$</p> <p>$x=2 \quad x=-2$</p>	<p>Answer: $x=0, y=x$</p> <p># <u>16</u> Find the equation for the slant asymptote to the graph of $f(x) = \frac{x^2-3x-4}{x+2}$.</p> <p>$x+2 \overline{) \begin{array}{r} x-5 \\ x^2-3x-4 \\ \underline{x^2+2x} \\ -5x-4 \\ \underline{-5x-10} \\ 6 \end{array}}$</p> <p>$y=x-5$</p> <p>num deg 1 more than den. deg. → slant</p>
<p>Answer: $x = -2$</p> <p># <u>5</u> Find the equation of the horizontal asymptote for the graph of $g(x) = \frac{x-2}{x-3}$.</p> <p>$y=1$</p> <p>degrees match Lead Lead</p>	<p>Answer: -1</p> <p># <u>13</u> The function $f(x) = \frac{2x^2-7x+6}{2x-3}$ has a removable discontinuity (a "hole") at $x = \frac{3}{2}$. What is the y-coordinate of the "hole"?</p> <p>$(2x-3)(x-2) = x-2$</p> <p>$(2x-3)$ $x = \frac{3}{2}$ hole $f(\frac{3}{2}) = \frac{3}{2} - 2 = -\frac{1}{2}$</p> <p>$f(\frac{3}{2}) = -\frac{1}{2}$</p>
<p>Answer: $y = \frac{1}{2}$</p> <p># <u>7</u> The functions $f(x) = \frac{2x+1}{x^2-4}$ and $g(x) = \frac{5}{x+6}$ have the same horizontal asymptote. What is its equation?</p> <p>den degree is bigger</p> <p>$y=0$</p>	<p>Answer: $y = -3$</p> <p># <u>18</u> Write the equation of the asymptote to the graph of $y = \ln(3+x)$.</p> <p>left 3</p> <p>$x = -3$</p>
<p>Answer: $1, 2$</p> <p># <u>12</u> Find the zero(s) of $g(x) = \frac{x^2-x-2}{x-2}$.</p> <p>$0 = \frac{x^2-x-2}{x-2}$</p> <p>$0 = (x-2)(x+1)$</p> <p>$x = -1$</p>	<p>Answer: $x=0, x=2, y=2$</p> <p># <u>9</u> Find the y-intercept $(0, ?)$ for the graph of $y = \frac{2x+1}{x^2-4}$. $x=0$ (plug in)</p> <p>$\frac{2(0)+1}{(0)^2-4} = \frac{-1}{4}$</p>
<p>Answer: $y = 3$</p> <p># <u>15</u> Find the asymptotes for $y = x + \frac{1}{x}$.</p> <p>$y = \frac{x^2+1}{x}$</p> <p>top big, no bot slant</p> <p>Find common denominator if diff in degrees is 2</p> <p>$y=x$ and $x=0$</p>	<p>Answer: $y = 1$</p> <p># <u>6</u> Find the equation of the horizontal asymptote to the graph of $f(x) = \frac{x-5}{2x+3}$.</p> <p>$y = \frac{1}{2}$</p> <p>degrees match Lead Lead</p>