2.6 Worksheet 2 Key

① $y = \frac{3}{x+2}$

Slant: dne

HA: $y = 0$

D: $x \neq -2$

VA: $x = -2$

Holes: dne

x-int: dne

y-int: $y = 0$

② $y = \frac{-4}{x+5} - 3$

$\frac{-4}{x+5} - \frac{3(x+5)}{x+5} = \frac{-4-3x-15}{x+5} = \frac{-3x-19}{x+5}$

$-3x - 19 = 0$

$-3x = 19$

$x = \frac{19}{-3}$

Slant: dne

HA: $y = -3$

D: $x \neq -5$

VA: $x = -5$

Holes: dne

x-int: $-\frac{19}{3}$

y-int: $\frac{-19}{5}$

③ $f'(x) = \frac{2x+3}{x}$

Slant: dne

HA: $y = 2$

D: $x \neq 0$

VA: $x = 0$

Holes: dne

x-int: $-\frac{3}{2}$

y-int: dne

④ $y = \dfrac{3x^2+5x-7}{x^2-3}$

Slant: dne

HA: $y=3$

D: $x \neq \pm\sqrt{3}$

VA: $x = \pm 3$

Holes: dne

x-int: $\dfrac{-5\pm\sqrt{109}}{6}$

y-int: $\dfrac{7}{3}$

Domain

$x^2-3=0$

$x^2=3$

$x \neq \pm\sqrt{3}$

x-int

$x = \dfrac{-5\pm\sqrt{25-4(3)(-7)}}{2(3)}$

$x = \dfrac{-5\pm\sqrt{109}}{6}$

⑤ $f(x) = \dfrac{5x^2-3}{x^2+7x-18} = \dfrac{5x^2-3}{(x-2)(x+9)}$

Slant: dne

HA: $y=5$

D: $x \neq -9, 2$

VA: $x=-9, 2$

Holes: dne

x-int: $\pm\dfrac{\sqrt{15}}{5}$

y-int: $\dfrac{1}{6}$

x-int

$5x^2-3=0$

$5x^2=3$

$x^2=\dfrac{3}{5}$

$x=\pm\sqrt{\dfrac{3}{5}}$

$x=\pm\dfrac{\sqrt{15}}{5}$

• or use the quadratic formula

⑥ $f(x) = \dfrac{6x^3+5x-1}{2x^3-18x^2+28x} = \dfrac{6x^3+5x-1}{2x(x-2)(x-7)}$ → does not factor

Slant: dne

HA: $y=3$

D: $x \neq 0, 2, 7$

VA: $x=0, 2, 7$

Holes: dne

x-int: dne → look @ graph on calculator

y-int: dne

x-int

cubic function which we will learn to solve but for now use your calculator

⑦ $y = \frac{x+5}{x^2-16} = \frac{x+5}{(x+4)(x-4)}$

Slant: dne

HA: $y=0$

D: $x \neq -4, 4$

VA: $x = -4, 4$

Holes: dne

x-int: $x=-5$

y-int: $-\frac{5}{16}$

⑧ $f(x) = \frac{2x-7}{3x^2-27} = \frac{2x+7}{3(x^2-9)} = \frac{2x+7}{3(x+3)(x-3)}$

Slant: dne

HA: $y=0$

D: $x \neq 3, -3$

VA: $x = 3, -3$

Holes: dne

x-int: $7/2$

y-int: $7/27$

⑨ $y = \frac{2x^2+5x-3}{x} = \frac{(2x-1)(x+3)}{x}$

Slant

$$x \overline{)\, 2x^2+5x-3}$$
$$2x+5$$
$$2x^2+0x$$
$$5x-3$$

Slant: $y = 2x+5$

HA: dne

D: $x \neq 0$

VA: $x=0$

Holes: dne

x-int: $\frac{1}{2}, -3$

y-int: dne

(10) $y = \frac{2x^2+3x-7}{x+4}$ → does not factor

Slant: $y = 2x-5$

HA: dne

D: $x \neq -4$

VA: $x = -4$

Holes: dne

x-int: $-\frac{3\pm\sqrt{65}}{4}$

y-int: $-\frac{7}{4}$

Slant

$$x+4 \overline{)\, 2x^2+3x-7}$$
$$2x-5$$
$$-(2x^2+8x)$$
$$-5x-7$$

x-int

$$x = \frac{-3\pm\sqrt{9-4(2)(-7)}}{2(2)} = \frac{-3\pm\sqrt{65}}{4}$$

(11) $f(x) = \frac{6x^2+5}{x-3}$

Slant: $y = 6x+18$

HA: dne

D: $x \neq 3$

VA: $x = 3$

Holes: dne

x-int: dne

y-int: $-\frac{5}{3}$

Slant:

$$x-3 \overline{)\, 6x^2+0x+5}$$
$$6x+18$$
$$-(6x^2-18x)$$
$$18x+5$$

x-int

$$6x^2+5=0$$
$$6x^2=-5$$
$$x^2=\frac{-5}{6}$$

(12) $y = \frac{6x^3+6x^2+2x-5}{3x^2+6x-45}$ → does not factor

$3x^2+6x-45 \rightarrow 3(x^2+2x-15) \rightarrow 3(x+5)(x-3)$

Slant: $y = 2x-2$

HA: dne

D: $x \neq -5, 3$

VA: $x = -5, 3$

Holes: dne

x-int: .6214 → in calculator

y-int: $\frac{1}{9}$

$$3x^2+6x-45 \overline{)\, 6x^3+6x^2+2x-5}$$
$$2x-2$$
$$-(6x^3+12x^2-90x)$$
$$-6x^2+92x-5$$

(13) Same as #11

Slant:

HA:

D:

VA:

Holes:

x-int:

y-int:

(14) $f(x) = \dfrac{3x^2 - 2}{4x + 8}$

Slant: $y = \frac{3}{4}x - \frac{3}{2}$

HA: dne

D: $x \neq -2$

VA: $x = -2$

Holes: dne

x-int: $\pm \frac{\sqrt{6}}{3}$

y-int: $-\frac{1}{2}$

Slant:

$$\begin{array}{r} \frac{3}{4}x - \frac{3}{2} \\ 4x+8 \overline{)\,3x^2 + 0x - 2} \\ -(3x^2 + 6x) \\ \hline -6x - 2 \end{array}$$

x-int

$3x^2 - 2 = 0$

$3x^2 = 2$

$x^2 = \frac{2}{3}$

$x = \pm\sqrt{\frac{2}{3}} = \pm\frac{\sqrt{6}}{3}$

Slant:

HA:

D:

VA:

Holes:

x-int:

y-int: