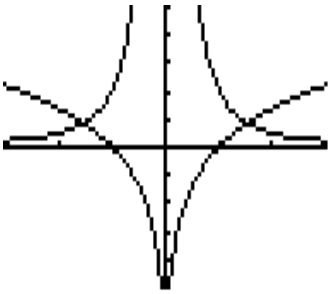
Section 9.1

1. solutions: $(-1.53, .85),\ (1.53, .85)$

$\mathtt{y_1} = 2/\mathtt{x} \wedge 2,\ \ \mathtt{y_2} = \mathtt{ln}(\mathtt{x} \wedge 2)$

$[-3, 3]$ by $[-5, 5]$



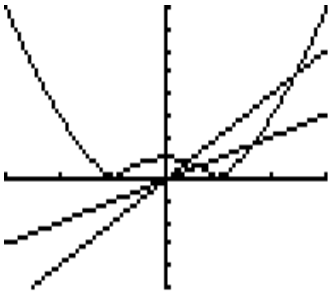
points of intersection

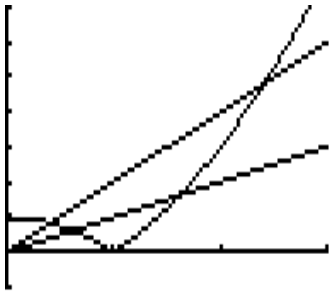
$(-1.531584, .8526055),\ (1.5315844, .8526055)$

3. solutions: $(.41, .83),\ (2.41, 4.83),\ (.62, .62),\ (1.62, 1.62)$

$\mathtt{y_1} = (3\mathtt{x} + \mathtt{abs}(\mathtt{x}))/2,$ $\mathtt{y_2} = (3\mathtt{x} - \mathtt{abs}(\mathtt{x}))/2,$ $\mathtt{y_3} = \mathtt{abs}(\mathtt{x} \wedge 2 - 1)$

$[-3, 3]$ by $[-5, 8]$ $[0, 3]$ by $[-1, 7]$





points of intersection

$(.41421356, .82842712),\ (2.4142136, 4.8284271),$
$(.61803399, .61803399),\ (1.618034, 1.618034)$

5. solutions: $(-2, 2),\ (3, -3)$

For the first equation, $2y^2 + xy - x^2 = 0$, solving for y:

By factoring, $2y^2 + xy - x^2 = (2y - x)(y + x) = 0$, so $y = \frac{1}{2}x,\ y = -x$

Or, by using the quadratic formula for y, $y = \frac{-x \pm 3|x|}{4}$

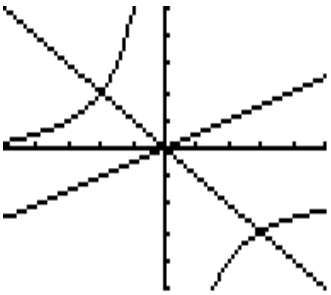
We can graph either set of equations for y.

For the second equation $xy + x + 6 = 0$, solving for y, we get $y = \frac{-x - 6}{x}$.

We can graph either of these sets of equations:

$\mathtt{y_1} = \mathtt{1/2x}$	or	$\mathtt{y_1} = (-\mathtt{x} + \mathtt{3abs(x)})/\mathtt{4}$,
$\mathtt{y_2} = -\mathtt{x}$		$\mathtt{y_2} = (-\mathtt{x} - \mathtt{3abs(x)})/\mathtt{4}$
$\mathtt{y_2} = (-\mathtt{x} - \mathtt{6})/\mathtt{x}$		$\mathtt{y_3} = (-\mathtt{x} - \mathtt{6})/\mathtt{x}$

$[-5, 5]$ by $[-5, 5]$



points of intersection $(-2, 2),\ (3, -3)$

Note: The origin $(0, 0)$ is common to y_1 and y_2,
both of which come from the first equation.
Thus, $(0, 0)$ is not a point of intersection with y_3.

7. solutions: $(-3.19, 2.68),\ (-2.01, 3.00),\ (-3.19, -0.68),\ (-2.01, -1.00)$

$\mathtt{y_1} = 1 + \sqrt{}(4 - (\mathtt{x} + 2) \wedge 2)$ $\quad$ $\mathtt{y_2} = 1 - \sqrt{}(4 - (\mathtt{x} + 2) \wedge 2)$

$\mathtt{y_3} = (2 + \sqrt{}(24 + 4\mathtt{x}))/2$ $\quad$ $\mathtt{y_4} = (2 - \sqrt{}(24 + 4\mathtt{x}))/2$

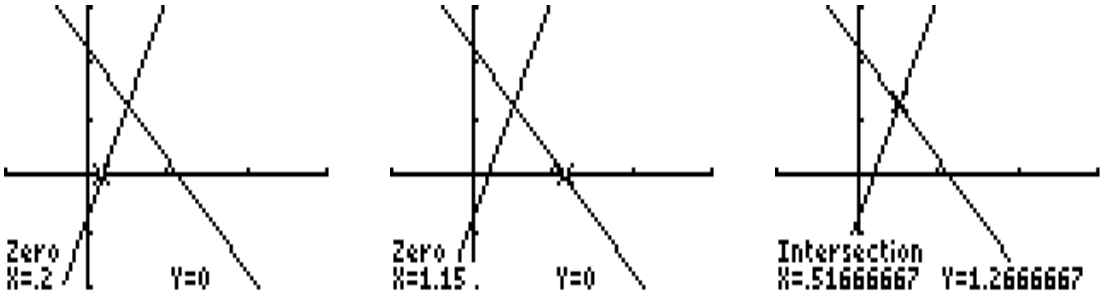
all functions	y_1 and y_3	y_2 and y_4
$[-7, 3]$ by $[-3, 5]$	$[-4, 0]$ by $[2, 4]$	$[-4, 0]$ by $[-2, 0]$

y_1 and y_3 intersect at $(-3.191608, 2.6758258),\ (-2.008392, 2.9979009)$

y_2 and y_4 intersect at $(-3.191608, -0.6758258),\ (-2.008392, -0.9979009)$

Section 9.2

1. $\mathtt{y_1} = 4\mathtt{x} - 0.8,\ \mathtt{y_2} = -2\mathtt{x} + 2.3$ $\quad$ $[-1, 3]$ by $[-2, 3]$



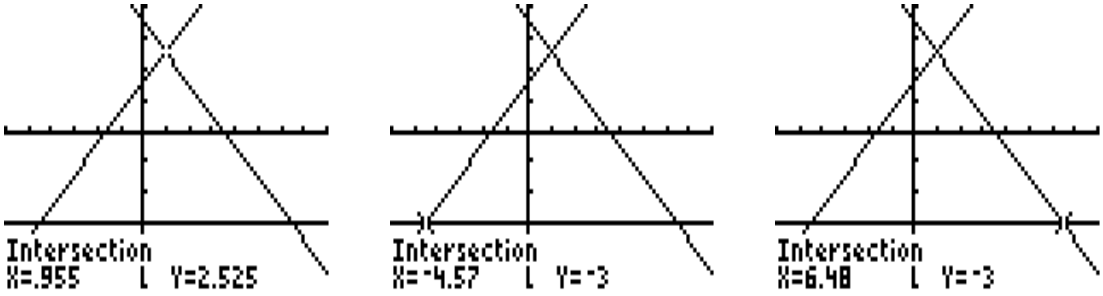
$x-$intercepts are 0.2 and 1.15.

The height of the triangle is 1.2667 (from the point of intersection).
The base is $1.15 - 0.2 = .95$ (difference of the $x-$interecepts).

$$\text{Area} = \frac{1}{2}\Big(1.2667\Big)\Big(.95\Big) = 0.6016825$$

The area is 0.6 square units.

3. $\mathtt{y_1 = x + 1.57},\ \mathtt{y_2 = 3.48 - x},\ \mathtt{y_3 = -3}$ $\quad [-6, 8]$ by $[-5, 4]$



points of intersection $(0.955, 2.525),\ (-4.57, -3),\ (6.48, -3)$

The height of the triangle is $2.525 + 3.0 = 5.525$.

The base is $4.57 + 6.48 = 11.05$.

Area $= \frac{1}{2}\Big(11.05\Big)\Big(5.525\Big) = 30.525625$

The area is 30.5 square units.

5. Putting the equations into slope-intercept form, we have

$$\begin{cases} y &= -\frac{2}{5}x + \frac{19}{5} \\ y &= \frac{5}{2}x - 2 \end{cases}$$

We have a $y-$intercept of -2 in the second equation, so the answer is either (A) or (C). The slopes are negative reciprocals, so the lines are perpendicular, but we cannot tell anything about that from the graph due to the scale not being the same on the $x-$ and $y-$axes.

The slopes are opposite in sign, which confirms either (A) or (C). The $y-$intercept on the first equation is almost 4, which matches graph (A).

Answer is (A).

7. Putting the equations into slope-intercept form, we have

$$\begin{cases} y &= -\frac{5}{6}x + 5 \\ y &= -\frac{5}{6}x + 5 \end{cases}$$

The two lines are the same. We have dependent systems.

Answer is (C).