Chapter 2 review
1) x-intercept let y = 0

4x – 6(0) = 12
4x = 12
x = 3

y-intercept let x = 0
4(0) – 6y = 12
-6y = 12
Y = -2

Answer #1: x-intercept (3,0) y-intercept (0, -2)

2) x-intercept let y = 0

0^2 = x + 49
0 = x + 49
-49 = x

y-intercept let x = 0

y^2 = 0 + 49
y^2 = 49
y^2 - 49 = 0
(y + 7)(y - 7) = 0

y + 7 = 0  y - 7 = 0

y = -7  y = 7

Answer #2: x-intercept (-49,0) y-intercepts (0, -7) and (0,7)
3) x-intercept let y = 0

0 = 2x² + 13x – 7

Need to factor, see the video for detail of bottoms up factoring.

0 = (2x – 1)(x + 7)

2x – 1 = 0  x + 7 = 0

2x = 1  x = -7

y = \frac{1}{2}

y-intercept let x = 0

y = 2(0)² + 13(0) – 7

y = -7

Answer #3: x-intercepts (-7,0) and (1/2, 0) y-intercept (0,-7)

4) x-intercept let y = 0 (use 0/1 to set up for cross multiplying)

\[ \frac{0}{1} = \frac{x-3}{3x+6} \]

Cross multiply

1(x-3) = 0(3x + 6)

x – 3 = 0

x = 3

y-intercept, let x = 0

y = \frac{0-3}{3(0)+6} = \frac{-3}{6} = \frac{-1}{2}

Answer #4: x-intercept (3,0) y-intercept (0, -1/2)
5) x-intercept let $y = 0$ (use 0/1 to set up for cross multiplying)

\[
\frac{0}{1} = \frac{x^2 - 5x - 6}{x+1}
\]

Cross multiply

\[1(x^2 - 5x - 6) = 0(x + 1)\]

\[x^2 - 5x - 6 = 0\]

\[(x - 6)(x + 1) = 0\]

\[x - 6 = 0 \quad x + 1 = 0\]

\[x = 6 \quad x = -1\]

y-intercept, let $x = 0$

\[y = \frac{0^2 - 5(0) - 6}{0 + 1} = \frac{-6}{1} = -6\]

Answer #5: x-intercepts (-1, 0) and (6, 0) y-intercept (0, -6)
6) let $y = 0$ to find $x$-intercept

$x^2 + 0^2 = 121$

$x^2 = 121$

$x^2 - 121 = 0$

$(x + 11)(x-11) = 0$

$x + 11 = 0$ \hspace{1cm} x - 11 = 0

$x = -11$ \hspace{1cm} x = 11

let $x = 0$ to find $y$-intercept

$0^2 + y^2 = 121$

$y^2 = 121$

$y^2 - 121 = 0$

$(y + 11)(y-11) = 0$

$y + 11 = 0$ \hspace{1cm} y - 11 = 0

$y = -11$ \hspace{1cm} y = 11

Answer 6: $x$-intercepts $(11,0)$ and $(-11,0)$ $y$-intercepts $(0,11)$ and $(0,-11)$

7) symmetric to $y$-axis (there really is no work I can show)

8) symmetric to $y$-axis (there really is no work I can show)

9) symmetric to $x$-axis (there really is no work I can show)
10) \( y^2 = x + 3 \)

Solve for \( y \)

\[ \sqrt{y^2} = \pm \sqrt{x + 3} \]

\[ y = \pm \sqrt{x + 3} \]

graph \( y_1 = \sqrt{x + 3} \) \( y_2 = -\sqrt{x + 3} \)

Appears symmetric to x-axis. Do appropriate test of replacing \( y \) with \(-y\) to confirm.

Test to show symmetric to x-axis.

\[ (-y)^2 = x + 3 \]

\[ (-y)(-y) = x + 3 \]

\[ y^2 = x + 3 \]

Answer #10: symmetric to x-axis
11) Sketch a graph of $y = -x^2 + 6$

![Graph of $y = -x^2 + 6$]

Appears symmetric to y-axis.

Do appropriate test of changing $x$ to $-x$ to confirm symmetry.

$(-x)^2 + y = 6$

$(-x)(-x) + y = 6$

$x^2 + y = 6$

#11 Answer: symmetric to y-axis
12) Sketch a graph of \( y = x^3 \)

Appears symmetric to the origin.

Do appropriate test of changing \( x \) to \(-x\) and \( y \) to \(-y\) to confirm.

\[-y = (-x)^3\]
\[-1y = (-1x)(-1x)(-1x)\]
\[-1y = -1x^3\]
\[-1y = -1(-1x)\]
\[(-1)(-1y) = (-1)(-1x^3)\]
\[y = x^3\]

Answer #12: symmetric to the origin
Chapter 2 review continued

13) Let $y = 0$ to find $x$-intercept

$2x + 3(0) = 12$

$2x = 12$

$x = 6$

Let $x = 0$ to find $y$-intercept

$2(0) + 3y = 12$

$3y = 12$

$y = 4$

Answer: $x$-intercept $(6,0)$ $y$-intercept $(0,4)$
14) multiply by 6 to clear fractions.

\[ 6 \times \frac{1}{2}x - 6 \times \frac{2}{3}y = 6 \times 5 \]

\[ 3x - 4y = 30 \]

Let \( y = 0 \) to find \( x \)-intercept

\[ 3x - 4(0) = 30 \]

\[ 3x = 30 \]

\[ x = 10 \]

let \( x = 0 \) to find \( y \)-intercept

\[ 3(0) - 4y = 30 \]

\[ -4y = 30 \]

\[ y = 30/-4 \]

\[ y = -15/2 \]

\( x \)-intercept \((10,0)\) \( y \)-intercept \((0, -15/2)\)
15) multiply by 3 to clear fraction

\[3 + \frac{2}{3}x + 3 \cdot 2y = 3 \cdot -4\]

\[2x + 6y = -12\]

Let \( y = 0 \) to find \( x \)-intercept

\[2x - 6(0) = -12\]

\[2x = -12\]

\[x = -6\]

Let \( x = 0 \) to find \( y \)-intercept

\[2(0) + 6y = -12\]

\[6y = -12\]

\[y = -12/6 = -2\]

\( x \)-intercept (-6,0) \( y \)-intercept (0,-2)
16) let \( m = 3 \), \( x_1 = 5 \) and \( y_1 = 1 \)

\[
y - y_1 = m(x - x_1)
\]

\[
y - 1 = 3(x - 5)
\]

\[
y - 1 = 3x - 15
\]

\[
+1 +1
\]

Answer #16: \( y = 3x - 14 \)

17) let \( m = \frac{2}{3} \), \( x_1 = -6 \), \( y_1 = 2 \)

\[
y - 2 = \frac{2}{3}(x - (-6))
\]

\[
y - 2 = \frac{2}{3}x + 4
\]

\[
+2 +2
\]

Answer #17: \( y = \frac{2}{3}x + 6 \)

18) Use \( m = 2 \) as given line of \( y = 2x + 6 \) has a slope of 2, our line is parallel so it has the same slope.

\( m = 2 \), \( x_1 = 2 \), \( y_1 = 1 \)

\[
y - 1 = 2(x - 2)
\]

\[
y - 1 = 2x - 4
\]

\[
+1 +1
\]

Answer #18: \( y = 2x - 3 \)
19) Use $m = \frac{4}{6}$ as given line of $y = \frac{4}{9}x - 1$ has a slope of $\frac{4}{9}$, our line is parallel so it has the same slope.

$m = \frac{4}{9} \ x_1 = 3 \ y_1 = -1$

$y - (-1) = \frac{4}{9} (x - 3)$

$y + 1 = \frac{4}{9} x - \frac{4}{3}$

$\frac{-1}{-1} - \frac{\frac{4}{3}}{-\frac{3}{3}}$

Answer #19: $y = \frac{4}{9}x - \frac{7}{3}$
20) Use formula \((x - h)^2 + (y - k)^2 = r^2\)

Let \(h = -3, \ k = -1\) and \(r = 3\)

\((x - (-3))^2 + (y - (-1))^2 = 3^2\)

equation written in standard form \((x+3)^2 + (y+1)^2 = 9\)
21) Use formula \((x - h)^2 + (y - k)^2 = r^2\)

Let \(h = -5\), \(k = 4\) and \(r = 2\)

\((x - (-5))^2 + (y - 4)^2 = 2^2\)

equation written in standard form \((x+5)^2 + (y-4)^2 = 4\)
22) group x’s and y’s move 9 over

\[ x^2 - 6x + y^2 - 4y = -9 \]

add \( c_1 \) and \( c_2 \)

\[(x^2 - 6x + c_1) + (y^2 - 4y + c_2) = -9 + c_1 + c_2 \]

\( c_1 = (-6/2)^2 = (-3)^2 = 9 \)

\( c_2 = (-4/2)^2 = (-2)^2 = 4 \)

\[(x^2 - 6x + 9) + (y^2 - 4y + 4) = -9 + 9 + 4 \]

\[(x - 3)(x - 3) + (y - 2)(y - 2) = 4 \]

Center \((3, 2)\) radius 2

Equation written in standard form \((x-3)^2+(y-2)^2 = 4\)
23)

\[ x^2 + 2x + c_1 + y^2 + 4y + c_2 = 11 + c_1 + c_2 \]

\[ c_1 = (2/2)^2 = (1)^2 = 1 \quad c_2 = (4/2)^2 = (2)^2 = 4 \]

\[ x^2 + 2x + 1 \quad + y^2 + 4y + 4 = 4 + 1 + 4 \]

\[ (x + 1)(x+1) \quad + (y + 2)(y + 2) = 9 \]

Center \((-1, -2)\) radius 3

equation written in standard form \((x+1)^2 + (y+2)^2 = 16\)
Use distance formula between (-2,3) and (2,6) to find radius \(^*\)

\[
d = \sqrt{(-2 - 2)^2 + (3 - 6)^2} = \sqrt{(-4)^2 + (-3)^2} = \sqrt{16 + 9} = \sqrt{25} = 5
\]

Radius: \( r = 5 \)

Use \( h = -2, k = 3, r = 5 \)

\((x - h)^2 + (y - k)^2 = r^2\)

\((x - (-2))^2 + (y - 3)^2 = 5^2\)

Answer #24: \((x+2)^2 + (y-3)^2 = 25\)
25) Find the center using midpoint between (1,4) and (-3,2)

Center = \left( \frac{1+(-3)}{2}, \frac{4+2}{2} \right) = (-1, 3)

Now find radius by finding the distance between (-1, 3) and (1,4)

\[ d = \sqrt{(-1 - 1)^2 - (3 - 4)^2} = \sqrt{4 + 1} = \sqrt{5} \]

Now use \( r = \sqrt{5} \), \( h = -1 \) and \( k = 3 \)

\[(x - h)^2 + (y - k)^2 = r^2\]

\[(x - (-1))^2 + (y - 3)^2 = \sqrt{5}^2\]

answer #25: \((x+1)^2 + (y-3)^2 = 5\)
Step 1: Initial equation

\[ M = \frac{k}{\sqrt{n}} \]

Step 2: Substitute \( M = 3 \) and \( n = 16 \) solve for \( k \) by cross multiplying

\[ 3 = \frac{k}{\sqrt{16}} \]

\[ \frac{3}{1} = \frac{k}{4} \]

\[ 1k = 3 \times 4 \]

\[ k = 12 \]

Step 3 plug in \( k = 12 \), \( n = 25 \) solve for \( M \)

\[ M = \frac{12}{\sqrt{25}} \]

Answer #26: \( M = \frac{12}{5} \)
27) Step 1, initial equation

\[ Y = kxz^2 \]

Step 2 solve for \( k \), let \( Y = 128, \ z = 4, \ x = 2 \)

\[ 128 = k(2)(4)^2 \]

\[ 128 = 32k \]

\[ 128/32 = k \]

\[ 4 = k \]

Step 3

Plug in \( k = 4, \ x = 3, \ z = 5 \)

\[ Y = 4(3)(5)^2 \]

Answer #27: \( Y = 300 \)
Step 1 initial equation

\[ D = \frac{k}{p} \]

Step 2 let \( D = 150 \) and \( p = 2.50 \) and solve for \( k \)

\[ 150 = \frac{k}{2.50} \]

\[ \frac{150}{1} = \frac{k}{2.50} \]

\[ 1(k) = 150(2.50) \]

\[ k = 375 \]

Step 3, let \( k = 375 \) and \( p = 4.00 \)

\[ D = \frac{375}{4} = 93.75 \]

We need to round as we can’t sell .75 bags of candy.

Answer #28: \( D \) is about 94 bags
29)

Step 1

\[ D = k t^2 \]

Step 2 let \( D = 10 \) and \( t = 1 \) solve for \( k \)

\[ 10 = k(1)^2 \]

\[ 10 = k \]

Step 3

Let \( k = 10 \), \( t = 5 \) solve for \( D \)

\[ D = 10(5)^2 \]

Answer #29: \( D = 250 \) feet