

Problem 1. Set your window to

```
Xmin=-5
Xmax=5
Xscl=1
Ymin=-50
Ymax=200
Yscl=50
Xres=1
```

Graph $y_1 = x^4 + 2x^3 - 13x^2 - 14x + 24$. Find all zeroes. Find the y -intercept by computing the value at $x = 0$.

- zeroes (2 points): -4, -2, 1, 3
- y -intercept (1 point): 24

Problem 2. Go to ZOOM, and select 6:ZStandard. Go to ZOOM again, and select 5:ZSquare. Graph $y_1 = \sqrt{36 - x^2}$ and $y_2 = -\sqrt{36 - x^2}$ on the same screen. What is the shape of the resulting graph?

- Shape (2 points): Circle

Now, delete the graph for $y_2 = -\sqrt{36 - x^2}$, and graph $y_2 = \frac{1}{3}x^2$, while keeping $y_1 = \sqrt{36 - x^2}$ on the same screen. Solve

$$\sqrt{36 - x^2} \geq \frac{1}{3}x^2$$

using your graphing calculator.

- Solution (3 points):

$$-3\sqrt{\frac{1}{2}(-1 + \sqrt{17})} \leq x \leq 3\sqrt{\frac{1}{2}(-1 + \sqrt{17})}$$

...or, approximately,

$$-3.74886 \leq x \leq 3.74886$$

Problem 3. Set your window to

```
Xmin=-5
Xmax=5
Xscl=1
Ymin=-30
Ymax=30
Yscl=5
Xres=1
```

Graph $y_1 = \frac{1}{4}x^4 - \frac{9}{2}x^2$. Find the x -values at which the graph attains its minimum.

- Minimum 1 (1 point): $(-3, 81/4) = (-3, -20.25)$

- Minimum 2 (1 point): $(3, 81/4) = (3, 20.25)$.

Go to ZOOM, and select 6:ZStandard. The quiz is now over.