

PART I: YOU MUST SHOW ALL WORK FOR FULL CREDIT!!!

1.) $y = 3\sin(x + \frac{\pi}{3})$
 \downarrow
 left

2

2.) $\frac{98}{7} = 14$ $5(2)^{\frac{14}{4}}$
 56.56854249

1

3.) $m^5 + m^3 - 6m$
 $m(m^4 + m^2 - 6)$
 $m(m^2 + 3)(m^2 - 2)$

4

4.) $\sin^2(32) + \cos^2(32) = 1$

1

5.) use graph to plot line

4

6.)

3

7.) $(\frac{m^2}{m^{1/3}})^{-1/2} = \frac{m^{-1}}{m^{-1/6}} = \frac{m^{1/6}}{m}$
 $m^{-5/6} = \frac{1}{\sqrt[6]{m^5}}$

2

8.) inverse of log is exponential
 $y = 3^x$

3

9.)

2

10.) $ab^x \cdot cd^x$
 $ac(bd)^x$

3

11.) $18x^2 - 24x + 87 = 0$
 $\frac{24 \pm \sqrt{(-24)^2 - 4(18)(87)}}{36}$
 $\frac{24 \pm \sqrt{-5688}}{36}$
 $\frac{24 \pm 6i\sqrt{158}}{36}$

4

12.) put in calc
 (-.9, 1.9)

2

13.) scatterplot is exponential form
 plug in pts.

3

14.) $\frac{64}{1.25} \frac{82}{1.25} \frac{100}{1.25}$ $\frac{64}{x-1.25} \frac{80}{x-1.25} \frac{100}{x-1.25}$

1

15.)

3

16.)

put in calc & get pt. of intersection

2

17.) $\frac{2}{x-4} + \frac{3}{x+3} = \frac{2x-2}{(x-4)(x+3)}$ $x = -1$

$2x-8+3x+9 = 2x-2$
 $5x+1 = 2x-2$
 $3x = -3$

1

18.)

$496 \pm 2(115)$
 496 ± 230

4

19.)

graph in calc

2

20.)

$R=0$ for $x+4$
therefore -4 is a root

2

- 21.) $(10, 1172) \rightarrow 28.378$ $(60, 7591.90) \rightarrow 46.7$
- $(19, 1357) \rightarrow 32.76$ $(69, 2990) \rightarrow 38.226$
- $(36, 1770.80) \rightarrow 38.226$ $(72, 3135.80) \rightarrow 38.226$

4

22.)

3

23.)

$300e^{-.58(1.5)}$
 $300e^{-.87}$

1

24.)

1

25.) $(1-i)(1-i)(1-i)$

$x - 2i + i^2$
 $-2i(1-i)$
 $-2i + 2i^2$
 (-1)

$F 2 2i 1$

26.)

population \rightarrow truckload
sample \rightarrow 3 pairs

95% of sample was satisfactory

27.) hypotenuse = 1

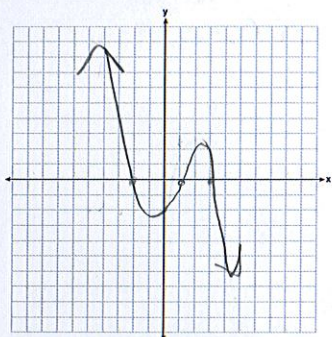
$$\sin \theta = \frac{y}{1}$$

therefore $\csc \theta = \frac{1}{y}$

28.) Decay

The graph decreases as 't' increases

29.)



30.)

$x^{\frac{1}{2}} = y^{\frac{1}{2}}$
 $x^{\frac{1}{2}} \cdot \frac{1}{2} = y^{\frac{1}{2}} \cdot \frac{1}{2}$

$$y = x^2$$

31.)

$$P(M) = \frac{230}{490}$$

$$P(RS) = \frac{180}{490}$$

$$P(\text{Both}) = \frac{70}{490}$$

$$\left(\frac{230}{490}\right)\left(\frac{180}{490}\right) \stackrel{?}{=} \frac{70}{490}$$

NO

32.)

Part III

$$\begin{array}{r} 3x + 13 \\ x - 2 \overline{) 3x^2 + 7x - 20} \\ \underline{- 3x^2 + 6x} \\ 13x - 20 \\ \underline{- 13x + 26} \\ 6 \end{array}$$

$$3x + 13 + \frac{6}{x - 2}$$

33.)

$$2x^3 - 10x^2 + 11x - 7 = (x-4)(2x^2 + hx + 3) + K$$

$$= 2x^3 + hx^2 + 3x - 8x^2 - 4hx - 12 + K$$

$$-7 = -12 + K$$

$$\boxed{K=5}$$

$$-10x^2 = hx^2 - 8x^2$$

$$+ 8x^2$$

$$-2x^2 = hx^2$$

$$\boxed{h=-2}$$

34.) Jillian \rightarrow same value added each week

$$a_1 = 10$$

$$a_n = a_{n-1} + 10$$

$$a_n = a_1 + (n-1)d$$

$$= 10 + (n-1)(10)$$

$$= 10 + n - 1$$

$$\boxed{a_n = n + 9}$$

35.)

$$P(P|K) = \frac{P(P \cap K)}{P(K)} = \frac{.019}{.023} = 82.6\%$$

If we choose person in Key Club
 there is 82.6% of that student
 being in AP Physics

$$36.) 20,000 = \text{PMT} \frac{(1 - (1 + 0.00625)^{-60})}{0.00625}$$

$$20,000 = \text{PMT} \frac{(1 - (1.00625)^{-60})}{0.00625}$$

$$20,000 = \text{PMT} \left(\frac{.3119081761}{.00625} \right)$$

$$20,000 = 49.90530818 \text{ PMT}$$

$$400.7589719$$

$$\boxed{\$400.76}$$

$$21,000 - X = 300 \left(\frac{1 - (1.00625)^{-60}}{0.00625} \right)$$

$$21,000 - X = 300(49.90530818)$$

$$X = 6028.407545$$

$$\boxed{X = 6028}$$

37.

$$S = \sqrt{t} - 2t + 6$$

$$0 = \sqrt{t} - 2t + 6$$

$$(2t - 6)^2 = \sqrt{t}^2$$

$$(2t - 6)(2t - 6) = t$$

$$4t^2 - 24t + 36 = t$$

$$4t^2 - 25t + 36 = 0$$

$$(4t - 9)(t - 4) = 0$$

$$t = \frac{9}{4}$$

$$t = 4$$

$$S = \sqrt{t} - 2(1) + 6$$

$$S = 1 - 2 + 6 = 5$$

$$\times 100 = 500$$

$$S = \sqrt{3} - 2(3) + 6$$

$$\sqrt{3} - 6 + 6 = \sqrt{3}$$

$$\times 100$$

$$500 - 100\sqrt{3}$$

$$326.7949192$$

$$\boxed{327}$$