SOLUTIONS TO PRACTICE QUESTIONS FOR THE FINAL EXAM

1. $16x^2 - 4y^8 = 4(4x^2 - y^8) = 4\left((2x)^2 - (y^4)^2\right) = 4(2x - y^4)(2x + y^4)$

2.
$$\left(\frac{36a^{-4}b^{10}c^2}{a^2c^{-6}}\right)^{-1/2} = (36a^{-6}b^{10}c^8)^{-1/2} = (36)^{-1/2}(a^{-6})^{-1/2}(b^{10})^{-1/2}(c^8)^{-1/2} =$$
$$= \frac{1}{(36)^{1/2}}a^3b^{-5}c^{-4} = \frac{1}{\sqrt{36}}\cdot\frac{a^3}{b^5c^4} = \frac{a^3}{6b^5c^4}$$

3.
$$\frac{3x}{3x+1} - \frac{x}{x-2} = \frac{3x}{(3x+1)}\cdot\frac{(x-2)}{(x-2)} - \frac{x}{(x-2)}\cdot\frac{(3x+1)}{(3x+1)} =$$
$$= \frac{3x(x-2) - x(3x+1)}{(3x+1)(x-2)} = \frac{3x^2 - 6x - 3x^2 - x}{(3x+1)(x-2)} = \frac{-7x}{(3x+1)(x-2)}$$

4.
$$(2x+1)^3(2)(3x-5)(3) + (3x-5)^2(3)(2x+1)^2(2)$$
$$= 6\left[(2x+1)^3(3x-5) + (3x-5)^2(2x+1)^2\right]$$
$$= 6(2x+1)^2\left[(2x+1)(3x-5) + (3x-5)^2\right]$$
$$= 6(2x+1)^2(3x-5)\left[(2x+1) + (3x-5)\right]$$
$$= 6(2x+1)^2(3x-5)(5x-4)$$
$$= 6(3x-5)(5x-4)(2x+1)^2$$

5.
$$\frac{xy^{-1}}{(x+y)^{-1}} = \frac{\frac{x}{y}}{\frac{1}{(x+y)}} = \frac{x}{y}\cdot\frac{(x+y)}{1} = \frac{x(x+y)}{y}$$

6.
$$A = P(1+rt)$$
$$A = P + \Pr t$$
$$A - P = \Pr t$$
$$\frac{A-P}{\Pr} = \frac{\Pr t}{\Pr}$$
$$\frac{A-P}{\Pr} = t$$
$$t = \frac{A-P}{\Pr}$$

7.
$$\frac{4}{2p-3} + \frac{10}{4p^2-9} = \frac{1}{2p+3}$$
$$\frac{4}{2p-3} + \frac{10}{(2p-3)(2p+3)} = \frac{1}{2p+3}$$
$$(2p-3)(2p+3)\cdot\left[\frac{4}{2p-3} + \frac{10}{(2p-3)(2p+3)}\right] = \left[\frac{1}{2p+3}\right]\cdot(2p-3)(2p+3)$$
$$(2p+3)\cdot 4 + 10 = 1\cdot(2p-3)$$
$$4(2p+3) + 10 = (2p-3)$$
$$8p + 12 + 10 = 2p - 3$$
$$8p - 2p = -3 - 12 - 10$$
$$6p = -25$$
$$p = -\frac{25}{6}$$

8.
$$\frac{\sqrt{x}+5}{\sqrt{x}-5} = \frac{(\sqrt{x}+5)}{(\sqrt{x}-5)}\frac{(\sqrt{x}+5)}{(\sqrt{x}+5)} =$$
$$= \frac{x + 5\sqrt{x} + 5\sqrt{x} + 25}{x + 5\sqrt{x} - 5\sqrt{x} - 25} = \frac{x + 10\sqrt{x} + 25}{x - 25}$$

9. t = # of hours the other person takes to complete the job.

fraction from 1st person + fraction from 2nd person=whole job

$$\left(\frac{1}{6}\right)\frac{job}{hour}\cdot 4hours + \left(\frac{1}{t}\right)\frac{job}{hour}\cdot 4hours = \left(\frac{1}{4}\right)\frac{job}{hour}\cdot 4hours$$
$$\left(\frac{2}{3}\right)job + \left(\frac{4}{t}\right)job = 1\,job$$
$$\frac{2}{3} + \frac{4}{t} = 1$$
$$3t\left(\frac{2}{3} + \frac{4}{t}\right) = 1\cdot 3t$$
$$2t + 12 = 3t$$
$$12 = t$$
$$t = 12$$

10.
$$\begin{cases} y = x + 1 \\ y^2 - x^2 = 145 \end{cases}$$
$$(x+1)^2 - x^2 = 145$$
$$x^2 + 2x + 1 - x^2 = 145$$
$$2x + 1 = 145$$
$$2x = 144$$
$$x = 72$$

11. let t = # hours truck has been traveling

$$40t = 55(t-1)$$
$$40t = 55t - 55$$
$$55 = 15t$$

	rate	time	distance
truck	40	t	40t
car	55	t - 1	55(t – 1)

$t = \frac{55}{15} = \frac{11}{3}$ hours, so distance is $40\left(\frac{11}{3}\right) = \frac{440}{3}$ miles

12.

let x = # ml of the 50% solution

let y = total # of ml

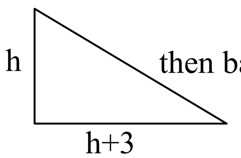
$$\begin{cases} x + 40 = y \\ x(.50) + 40(.20) = y(.25) \end{cases}$$
$$x(.50) + 8 = (x + 40)(.25)$$
$$.50x + 8 = .25x + 10$$
$$.25x = 2$$
$$x = 8 \text{ ml}$$

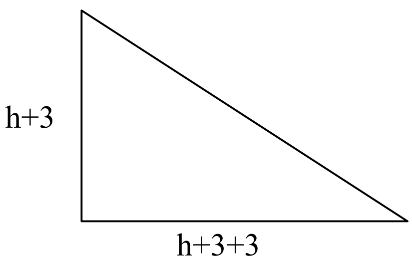
B

13.

Let h = height of original triangle

then base of original triangle = h+3





New:

Area of new triangle $= 14\ in^2$

$\frac{1}{2}(h+3)(h+6) = 14$

$(h+3)(h+6) = 28$

$h^2 + 3h + 6h + 18 = 28$

A

$h^2 + 9h - 10 = 0$

$(h+10)(h-1) = 0$

$h = -10, \quad h = 1$

Original height = 1 *in*.

Original base = 1 + 3 = 4 *in*.

14.
let t = number of years after 1980 and let V =value
t is the independent variable and V is the dependent variable

points on line $\Rightarrow$ $(1,54)$ and $(3,62)$

slope $\Rightarrow$ $m = \frac{62-54}{3-1} = \frac{8}{2} = 4$

$V - V_1 = m(t - t_1)$

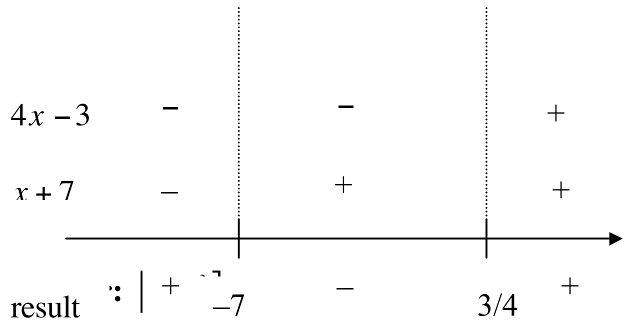
$V - 54 = 4(t-1)$

$V - 54 = 4t - 4$

$V = 4t + 50$

A

15. $(4x-3)(x+7) \le 0$



16.

$|6 - 2x| \le 3$

$-3 \le 6 - 2x \le 3$

$-9 \le -2x \le -3$

$\frac{9}{2} \ge x \ge \frac{3}{2}$

C

$\frac{3}{2} \le x \le \frac{9}{2}$

17.

$A\ (1,-2)$, Midpoint $M\ (2,3)$, $B\ (x,y)$

Midpoint $\Rightarrow \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Midpoint of $\overline{AB} \Rightarrow \left(\frac{1+x}{2}, \frac{-2+y}{2}\right) \Rightarrow (2,3)$

$\frac{1+x}{2} = 2, \qquad \frac{-2+y}{2} = 3$

$1 + x = 4, \qquad -2 + y = 6$

$x = 3, \qquad y = 8$

so $B\ (3,8)$

C

18.

slope of line $\Rightarrow$ $m = -\frac{1}{3}$

slope of line perpendicular $\Rightarrow$ $m = 3$

D

19.

$2x - 3y = 7$

$-3y = -2x + 7$

$y = \frac{2}{3}x - \frac{7}{3}$

slope $m = \frac{2}{3}$

slope of parallel line $m = \frac{2}{3}$

point is $(2,-1)$; $m = \frac{2}{3}$

$y = mx + b$

$-1 = \left(\frac{2}{3}\right)(2) + b$

C

$-1 = \frac{4}{3} + b$

$b = -\frac{7}{3}$ so $y = \frac{2}{3}x - \frac{7}{3}$

20.

Center $\Rightarrow$ $(0,2)$ $(x-h)^2 + (y-k)^2 = r^2$

radius $= 2$ $(x-0)^2 + (y-2)^2 = 2^2$

$x^2 + (y-2)^2 = 4$

B

$x^2 + y^2 - 4y + 4 = 4$

$x^2 + y^2 - 4y = 0$

21.

$f(x) = 1 - \sqrt{x}$, $g(x) = \frac{1}{x}$

D

$(g \circ f)(x) = g[f(x)] = g\left(1 - \sqrt{x}\right) = \frac{1}{1 - \sqrt{x}}$

22.

$f(x) = \frac{x}{x^2 + 1}$

D

$\frac{1}{f(3)} = \frac{1}{\frac{3}{(3)^2 + 1}} = \frac{1}{\frac{3}{10}} = \frac{10}{3}$

23.

$y = \frac{1}{3x - 2}$

$x = \frac{1}{3y - 2}$

$x(3y - 2) = 1$

$3xy - 2x = 1$

$3xy = 1 + 2x$

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

24.

$f(x) = x^2 - 2x + 4$

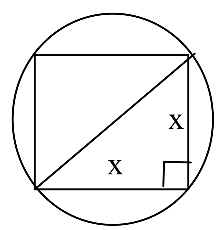
$\frac{f(x+h) - f(x)}{h} = \frac{(x+h)^2 - 2(x+h) + 4 - (x^2 - 2x + 4)}{h}$

A

$= \frac{x^2 + 2xh + h^2 - 2x - 2h + 4 - x^2 + 2x - 4}{h} = \frac{2xh + h^2 - 2h}{h}$

$= \frac{h(2x + h - 2)}{h} = 2x + h - 2$

25.



Let A = area of circle

Area of circle $\Rightarrow$ $A(r) = \pi r^2$

Diameter (d) of circle $\Rightarrow$ $x^2 + x^2 = d^2$

$2x^2 = d^2$

A

$d = \pm\sqrt{2x^2}$

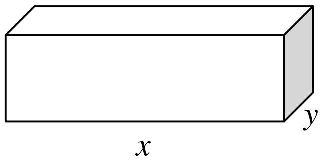
$d = x\sqrt{2}$

Radius (r) of circle $\Rightarrow$ $r = \frac{x\sqrt{2}}{2}$

So, $A(x) = \pi\left(\frac{x\sqrt{2}}{2}\right)^2 = \pi\left(\frac{x^2(2)}{4}\right)$

$= \frac{\pi x^2}{2}$ or $\frac{\pi}{2}x^2$

26.



$$\text{Volume} = 6 ft.^3$$

$$xy(1.5) = 6$$

$$y = \frac{6}{1.5x}$$

B

$$y = \frac{4}{x}$$

27.

$$T = k\frac{a^3}{\sqrt{d}}$$

$$4 = k\frac{2^3}{\sqrt{9}}$$

$$4 = k\frac{8}{3}$$

$$k = \frac{4}{1}\cdot\frac{3}{8}$$

$$k = \frac{3}{2}$$

$$T = \frac{3}{2}\cdot\frac{(-1)^3}{\sqrt{4}}$$

$$T = \frac{3}{2}\cdot\left(-\frac{1}{2}\right)$$

$$T = -\frac{3}{4}$$

A

28.

$$x^2 - 4x - 2y - 4 = 0$$

$$2y = x^2 - 4x - 4$$

$$2y = (x^2 - 4x + 4) - 4 - 4$$

$$2y = (x-2)^2 - 8$$

$$y = \tfrac{1}{2}(x-2)^2 - 4$$

$$y = a(x-h)^2 + k$$

$$Vertex(h,k) = (2,-4)$$

29.

Vertex $\Rightarrow V(0,2)$

point on parabola $\Rightarrow$ (1,0)

$$y = a(x-h)^2 + k$$

$$y = a(x-0)^2 + 2$$

$$y = ax^2 + 2$$

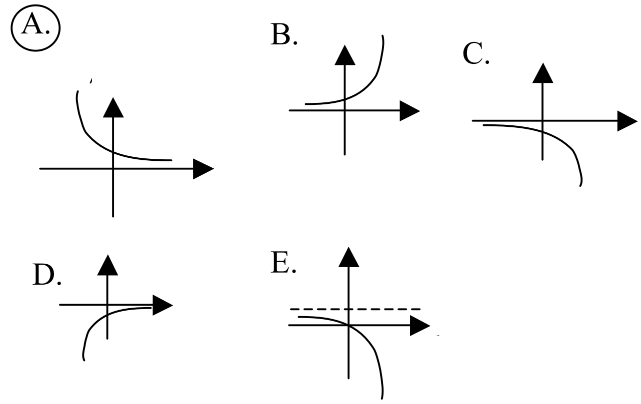
B

$$0 = a(1)^2 + 2$$

$$a = -2$$

$$y = -2x^2 + 2$$

30.



31.

$$\log_b y^3 + \log_b y^2 - \log_b y^4 = \log_b(y^3y^2) - \log_b y^4$$

$$= \log_b y^5 - \log_b y^4 = \log_b\left(\frac{y^5}{y^4}\right) = \log_b y$$

B

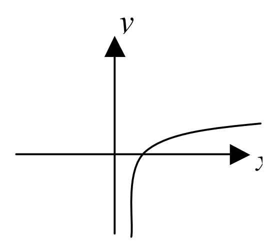
32.

$f(x) = \log_a x$ if $a > 1$

example: if $a = 2$, then $f(x) = \log_2 x$,

D

Graph of $y = \log_2 x \Rightarrow 2^y = x$



f is increasing, f does not have a as an x - intercept (the x - int. is (1,0)), f does not have a y - intercept, the domain of f is $(0,\infty)$.

33.

$$\log\left(\frac{432}{\left(\sqrt{.095}\right)\left(\sqrt[3]{72.1}\right)}\right) = \log\left(\frac{432}{(.095)^{\frac{1}{2}}(72.1)^{\frac{1}{3}}}\right)$$

$$= \log 432 - \left(\log\left[(.095)^{\frac{1}{2}}(72.1)^{\frac{1}{3}}\right]\right)$$

B

$$= \log 432 - \left(\log(.095)^{\frac{1}{2}} + \log(72.1)^{\frac{1}{3}}\right)$$

$$= \log 432 - \frac{1}{2}\log .095 - \frac{1}{3}\log 72.1$$

34.

$$\log_x 2 = 5$$

$$x^5 = 2$$

$$\left(x^5\right)^{\frac{1}{5}} = (2)^{\frac{1}{5}}$$

D

$$x = \sqrt[5]{2}$$

$$x \approx 1.1487$$

35.

$$\frac{\log_5\left(\frac{1}{8}\right)}{\log_5(2)} = \log_2\left(\tfrac{1}{8}\right) = \log_2\left(2^{-3}\right) = -3$$

36.

$$3^{x-5} = 4$$

$$\log 3^{x-5} = \log 4$$

$$(x-5)\log 3 = \log 4$$

C

$$x - 5 = \frac{\log 4}{\log 3}$$

$$x = \frac{\log 4}{\log 3} + 5$$

37.

$$\log_3 \sqrt{2x+3} = 2$$

$$3^2 = \sqrt{2x+3}$$

$$\sqrt{2x+3} = 9$$

C

$$\left(\sqrt{2x+3}\right)^2 = (9)^2$$

$$2x + 3 = 81$$

$$2x = 78$$

$$x = 39$$

Check : $\sqrt{2(39)+3} = 9$

$9 = 9$

Check : $\log_3 \sqrt{2(39)+3} = 2$

$3^2 = \sqrt{81}$

38.

$\log_3 m = 8$

$\log_3 n = 10 \quad \Rightarrow$

$\log_3 p = 6$

$$\log_3\left(\frac{\sqrt{mn}}{p^3}\right) = \log_3(mn)^{\frac{1}{2}} - \log_3 p^3$$

$$= \log_3\left(m^{\frac{1}{2}}n^{\frac{1}{2}}\right) - \log_3 p^3$$

A

$$= \log_3 m^{\frac{1}{2}} + \log_3 n^{\frac{1}{2}} - \log_3 p^3$$

$$= \frac{1}{2}\log_3 m + \frac{1}{2}\log_3 n - 3\log_3 p$$

$$= \frac{1}{2}(8) + \frac{1}{2}(10) - 3(6)$$

$$= 4 + 5 - 18 = -9$$

39. Half-life means when half of te initial amount still remains, $\frac{1}{2}q_o$.

$$\tfrac{1}{2}q_o = q_o e^{-0.0063t}$$

$$\tfrac{1}{2} = e^{-0.0063t}$$

$$\ln\left(\tfrac{1}{2}\right) = \ln\left(e^{-0.0063t}\right)$$

$$\ln\left(\tfrac{1}{2}\right) = -0.0063t$$

$$\frac{\ln(0.5)}{-0.0063} = t \approx 110.0 \text{ days}$$

40.

$$y = 2 + 2^x$$

When $x = 0, \quad y = 2 + 2^0$

D

$$y = 2 + 1 = 3$$

41.

$$\begin{cases} x + 4y = 3 \Rightarrow x = 3 - 4y \\ 2x - 6y = 8 \end{cases}$$

$$2(3 - 4y) - 6y = 8$$

$$6 - 8y - 6y = 8$$

$$y = \tfrac{2}{-14} = -\tfrac{1}{7} \Rightarrow x = 3 - 4\left(-\tfrac{1}{7}\right) = \tfrac{25}{7}$$

$$\left(\tfrac{25}{7}, -\tfrac{1}{7}\right)$$

42.

$$\begin{cases} x^2 + y^2 = 16 \\ 2y - x = 4 \Rightarrow x = 2y - 4 \end{cases}$$

$$(2y-4)^2 + y^2 = 16$$

$$4y^2 - 16y + 16 + y^2 = 16$$

$$5y^2 - 16y = 0$$

$$y(5y - 16) = 0$$

$$y = 0 \Rightarrow x = 2(0) - 4 = -4$$

$$y = \tfrac{16}{5} \Rightarrow x = 2\left(\tfrac{16}{5}\right) - 4 = \tfrac{12}{5}$$

$$(-4, 0)\ \&\ \left(\tfrac{12}{5}, \tfrac{16}{5}\right)$$

43.

$$\begin{cases} x + y - z = -1 \quad \Rightarrow x = -y + z - 1 \\ 4x - 3y + 2z = 16 \\ 2x - 2y - 3z = 5 \end{cases}$$

$$\begin{cases} 4(-y + z - 1) - 3y + 2z = 16 \\ 2(-y + z - 1) - 2y - 3z = 5 \end{cases}$$

$$\begin{cases} -7y + 6z - 4 = 16 \\ -4y - z - 2 = 5 \end{cases}$$

$$\begin{cases} -7y + 6z = 20 \\ -4y - z = 7 \quad \Rightarrow z = -4y - 7 \end{cases}$$

$$-7y + 6(-4y - 7) = 20$$

$$-31y = 62$$

$$y = -2$$

$$y = -2 \Rightarrow z = -4(-2) - 7$$

$$z = 1$$

44.

$$\begin{array}{r} x^2 + 6x + 34 \\ x^2 - 6x + 0 \overline{\smash{)}\, x^4 + 0x^3 - 2x^2 + 0x - 3} \\ +\left({}^{-}x^4 + 6x^3 + {}^{-}0x^2\right) \\ \hline 6x^3 - 2x^2 + 0x \\ +\left({}^{-}6x^3 + 36x^2 + {}^{-}0x\right) \\ \hline 34x^2 + 0x - 3 \\ +\left({}^{-}34x^2 + 204x + {}^{-}0\right) \\ \hline 204x - 3 \end{array}$$

C

$$q(x) = x^2 + 6x + 34$$

$$r(x) = 204x - 3$$

45. If the denominator of the function is equal to zero the function will be undefined.

$$f(x) = \frac{(x+3)(x-3)}{x(x+2)}$$

when $x = 0$ or $x = -2$

46.

$$y = x^2(x-1)(x+1)^2$$

x - intercepts: $x^2(x-1)(x+1)^2 = 0$

$$x = 0,\ x = 1,\ x = -1$$

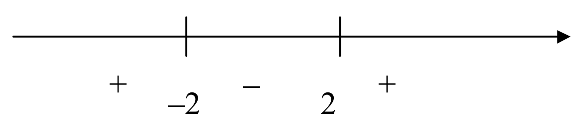
A

Interval	$(-\infty, -1)$	$(-1, 0)$	$(0, 1)$	$(1, \infty)$
x^2	+	+	+	+
$x - 1$	−	−	−	+
$(x+1)^2$	+	+	+	+
Result	− below x - axis	− below x - axis	− below x - axis	+ above x - axis

47.

$x = 2 \Rightarrow$ x - intercept

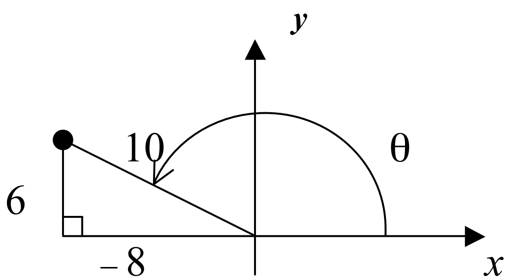
$x = -2 \Rightarrow$ vertical asymptote



E is the closest answer. The scale is a bit off on the x-axis.

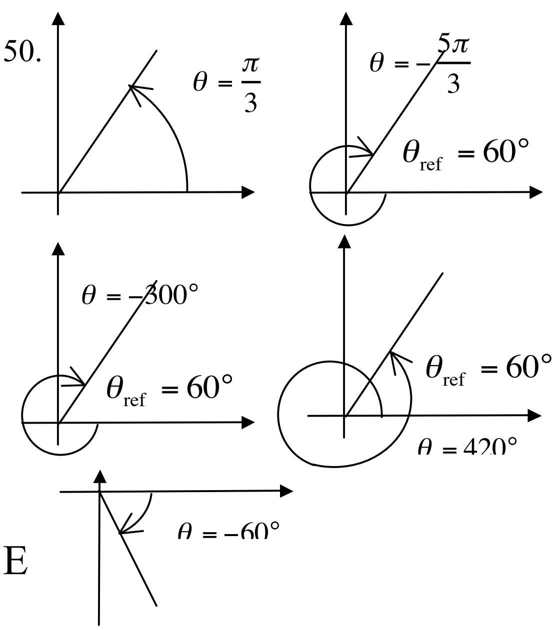
48. Shifted left 1 unit, then reflected about x-axis, then shifted down 2 units -- Answer: C

49.



$$\sin\theta = \frac{6}{10} = \frac{y}{r}$$
$$x^2 + y^2 = r^2$$
$$x^2 + 6^2 = 10^2$$
$$x^2 = 64$$
$$x = \pm 8$$
$$x = -8$$
$$\cos\theta = \frac{x}{r} = \frac{-8}{10} = -0.8$$

50.



E

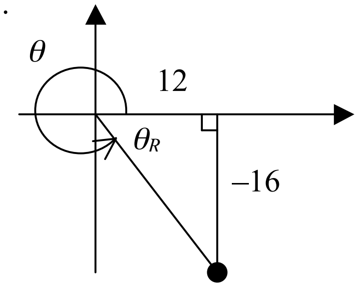
51.

$$135° \cdot \frac{\pi \text{ radians}}{180°} = \frac{3\pi}{4}$$

52.

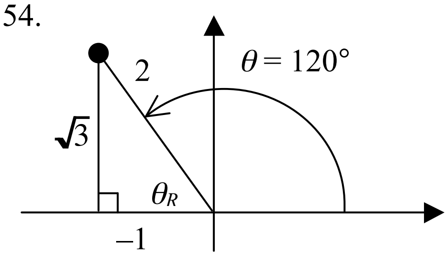
$$\sec 126° = \frac{1}{\cos 126°} \approx \frac{1}{-0.587785} \approx -1.7013$$

53.



$$\tan\theta = \frac{y}{x} = \frac{-16}{12} = -\frac{4}{3}$$

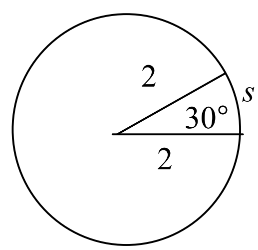
54.



$\theta_R = 60°$

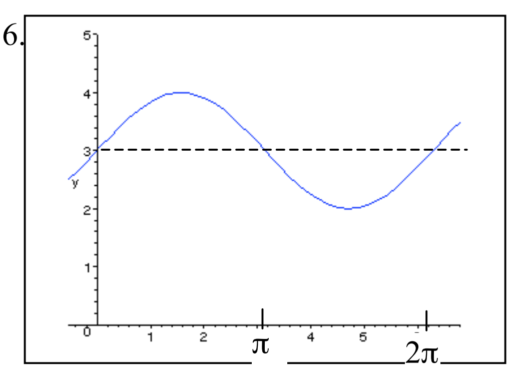
$$\tan\theta = \frac{y}{x} = \frac{\sqrt{3}}{-1} = -\sqrt{3}$$

55.



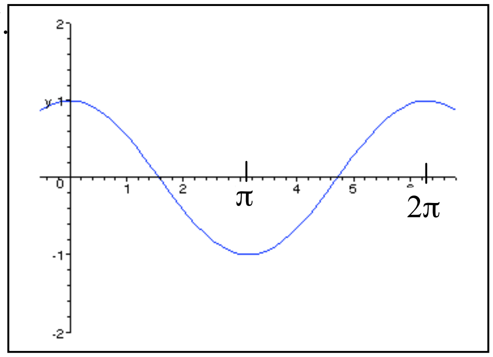
$$s = r\theta = 2\left(\frac{\pi}{6}\right) = \frac{\pi}{3} \approx 1.047$$

56.



The graph is the $y = \sin x$ shifted up three units.
I(yes), II(no), III(yes), IV(yes), **B**

57.



D = all real number = $(-\infty,\infty)$

R = all possible outputs/y-values = $[-1,1]$

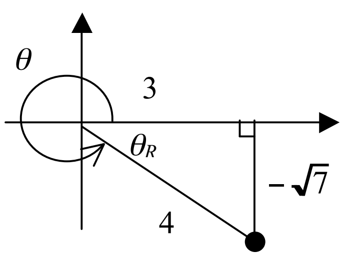
58.

59.

$$\frac{\tan x\cdot\cos x\cdot\csc x}{\cot x\cdot\sec x\cdot\sin x}=\frac{\tan x\cdot\tan x\cdot\cos x\cdot\cos x}{\sin x\cdot\sin x}$$

$$=\frac{\tan^2 x\cdot\cos^2 x}{\sin^2 x}=\frac{\sin^2 x}{\cos^2 x}\cdot\frac{\cos^2 x}{\sin^2 x}=1$$

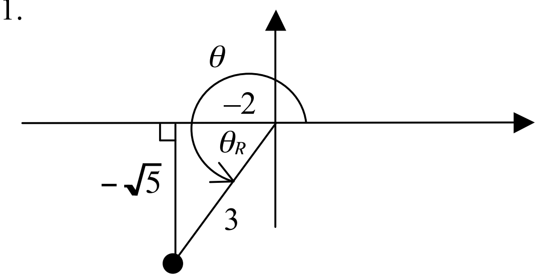
60.



$$x^2+y^2=r^2$$
$$y^2=4^2-3^2$$
$$y=\pm\sqrt{7}$$
$$y=-\sqrt{7}$$

$$\sin 2\theta=2\sin\theta\cos\theta$$
$$=2\left(\frac{-\sqrt{7}}{4}\right)\left(\frac{3}{4}\right)=-\frac{3\sqrt{7}}{8}$$

61.



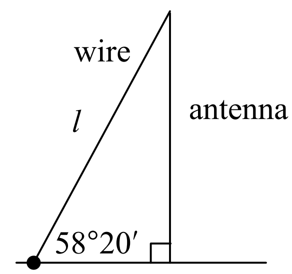
Given: $\tan\theta=\frac{\sqrt{5}}{2}=\frac{-\sqrt{5}}{-2}=\frac{y}{x}$ ⇑

$\underbrace{\frac{\theta}{2}\text{ is in QII}}$, $\cos\left(\frac{\theta}{2}\right)=\pm\sqrt{\frac{1+\cos\theta}{2}}$

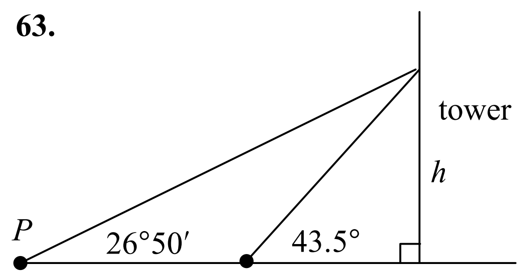
$$\cos\left(\frac{\theta}{2}\right)=-\sqrt{\frac{1+\left(\frac{-2}{3}\right)}{2}}=-\sqrt{\frac{1-\frac{2}{3}}{2}}$$

62.

$$\cos 58.\overline{3}^\circ=\frac{40}{l}$$
$$l\cdot\cos 58.\overline{3}^\circ=40$$
$$l=\frac{40}{\cos 58.\overline{3}^\circ}$$
$$l\approx 76.2\text{ m}$$



63.



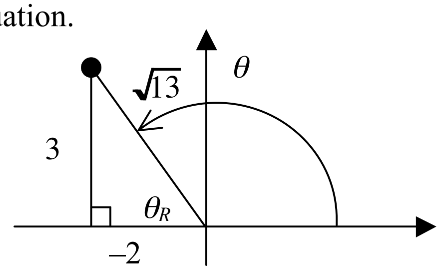
$$\tan 43.5^\circ=\frac{h}{x},\quad \tan 26.8\overline{3}^\circ=\frac{h}{x+25}$$
$$h=x\cdot\tan 43.5^\circ$$
$$\tan 26.8\overline{3}^\circ=\frac{x\cdot\tan 43.5^\circ}{x+25}$$
$$\tan 26.8\overline{3}^\circ(x+25)=x\cdot\tan 43.5^\circ$$
$$x\tan 26.8\overline{3}^\circ+25\tan 26.8\overline{3}^\circ=x\cdot\tan 43.5^\circ$$
$$25\tan 26.8\overline{3}^\circ=x\cdot\tan 43.5^\circ-x\tan 26.8\overline{3}^\circ$$
$$x=\frac{25\tan 26.8\overline{3}^\circ}{\tan 43.5^\circ-\tan 26.8\overline{3}^\circ}\approx 28.541487$$
$$h=x\cdot\tan 43.5^\circ\approx 27.1\text{ meters}$$

64. Examine r when $\theta = 0$ and as $\theta \to 90°$

A. $r = 1$ when $\theta = 0$ and as $\theta \to 90°$ $r \to 2$, looks right as the angle changes from 0° to 90°.
B. $r = 2$ when $\theta = 0$ and as $\theta \to 90°$ $r \to 1$, looks incorrect as the angle changes from 0° to 90°. The radial distance should be getting bigger.
C. $r = 1$ when $\theta = 0$ and as $\theta \to 90°$ $r \to 0$, looks incorrect as the angle changes from 0° to 90°. The radial distance should be getting bigger.
D. $r = 2$ when $\theta = 0$ and as $\theta \to 90°$ $r \to 0$, looks incorrect as the angle changes from 0° to 90°. The radial distance should be getting bigger.
E. $r = 0$ when $\theta = 0$ and as $\theta \to 90°$ $r \to 2$, looks incorrect as the angle changes from 0° to 90°. When the angle is zero the radial distance should greater than zero.

Plugging in further angles would yield more points that will confirm that **A** is the correct polar equation.

65.



$$r^2 = \left(-2^2\right) + 3^2$$

$$r = \sqrt{13}$$

$$\tan\theta = \frac{y}{x} = \frac{3}{-2} \Rightarrow \tan^{-1}\left(-\frac{3}{2}\right) \approx -56.301°$$

$$\theta_R = +56.301°$$

$$\theta = 180° - \theta_R \approx 123.7°$$

$$\left(\sqrt{13}, 123.7°\right)$$

66.

$$x^2 - 2x + y^2 = 0$$

$$x^2 + y^2 - 2x = 0$$

$$r^2 - 2r\cos\theta = 0$$

$$r(r - 2\cos\theta) = 0$$

$r = 0$, which is not an equation of the given circle

<u>*or*</u> $\underline{r = 2\cos\theta}$