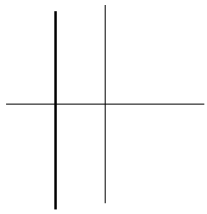
MATH1040 Practice questions 8

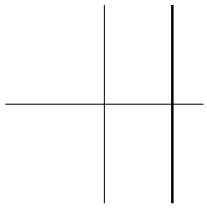
1. Answer each of the following questions, showing all working.

(a) There are eight equations given in this question, and you need to match each equation with its corresponding graph. The graphs are shown below.

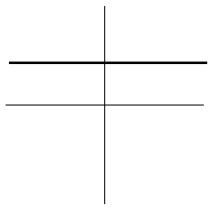
Graph A



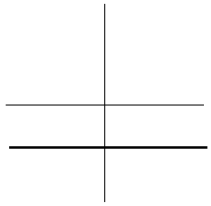
Graph B



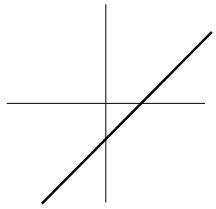
Graph C



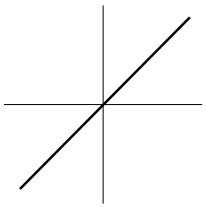
Graph D



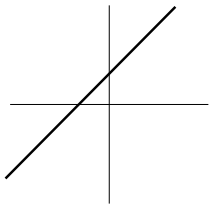
Graph E



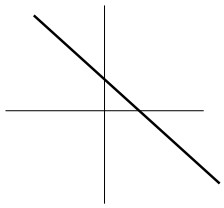
Graph F



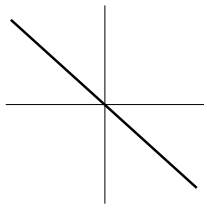
Graph G



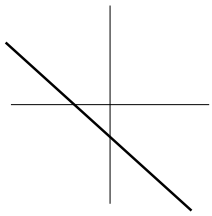
Graph H



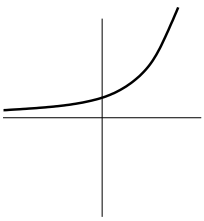
Graph I



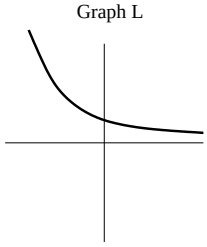
Graph J



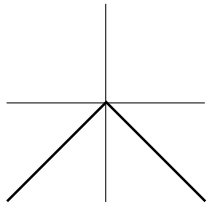
Graph K



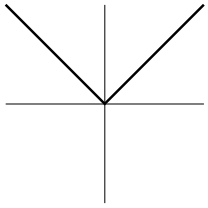
Graph L



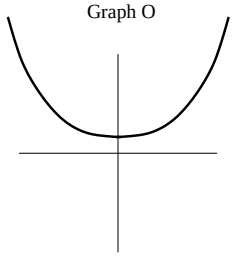
Graph M



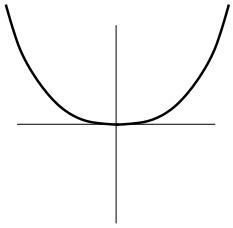
Graph N



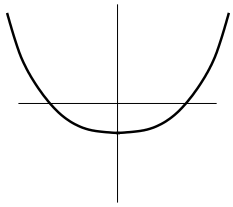
Graph O



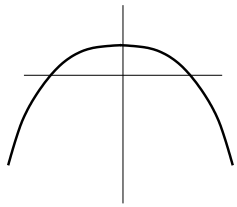
Graph P



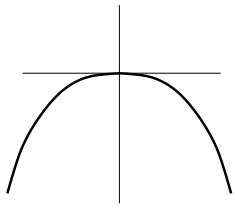
Graph Q



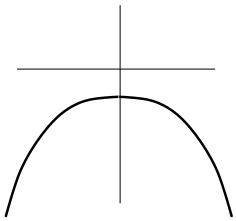
Graph R



Graph S



Graph T



(i) Equation is: $-y + 3x + 1 = 2$

(ii) Equation is: $-3y - 2x - 3 = -2$

(iii) Equation is: $3y - 2 = 1$

(iv) Equation is: $-y + 2x + 2 = 1$

(v) Equation is: $y = -3x^2 - 2$.

(vi) Equation is: $y = e^{-3x}$.

(vii) Equation is: $y = 3x^2$.

(viii) Equation is: $y = e^{x}$.

(b) If \$100 is invested for 4 years at a rate of 12% per annum, find the final balance if interest compounds:

(i) annually?

(ii) every six months?

(iii) monthly?

(iv) continuously?

(c) Convert each of the following angles from radians to degrees:

$$2\pi \qquad -\pi \qquad \frac{3\pi}{2} \qquad \frac{-5\pi}{2} \qquad \frac{-\pi}{3} \qquad \frac{-11\pi}{4} \qquad \frac{13\pi}{6} \qquad \frac{22\pi}{9}.$$

(d) Convert each of the following angles from degrees to radians:

$$180^\circ \qquad -360^\circ \qquad 450^\circ \qquad -270^\circ \qquad -120^\circ \qquad 315^\circ \qquad 30^\circ \qquad 320^\circ.$$

(e) Without using a calculator, find each of:

(i) $\log_{10} 1$.

(ii) $\log_{10} \dfrac{1}{100000}$.

(iii) $\ln e^4$.

(iv) $\ln \dfrac{1}{e^5}$.

(f) On a set of axes sketch a graph of $y = \sin x$ and $y_1 = \sin 2x$ for $x \in [-2\pi, 2\pi]$.
On another set of axes sketch $y = \sin x$ and $y_2 = -\sin x$ for $x \in [-2\pi, 2\pi]$.

2. Answer each of the following questions, showing all working.

(a) There are eight equations given in this question, and you need to match each equation with its corresponding graph. The graphs are shown in Question 1, Part (a).

(i)	Equation is:	$y = -3x^2 + 2$.	**(ii)**	Equation is:	$2y + 2x + 1 = 2$
(iii)	Equation is:	$y = 3 \mid 4x \mid$.	**(iv)**	Equation is:	$y = 2x^2 - 2$.
(v)	Equation is:	$y = 3x^2$.	**(vi)**	Equation is:	$y = -2x^2$.
(vii)	Equation is:	$-y + 2x = 3$	**(viii)**	Equation is:	$3y - 3x - 3 = 3$

(b) If \$100 is invested for 8 years at a rate of 12% per annum, find the final balance if interest compounds:

(i) annually?

(ii) every six months?

(iii) monthly?

(iv) continuously?

(c) Convert each of the following angles from radians to degrees:

$$2\pi \qquad -5\pi \qquad \frac{\pi}{2} \qquad \frac{-5\pi}{2} \qquad \frac{7\pi}{3} \qquad \frac{3\pi}{4} \qquad \frac{-17\pi}{6} \qquad \frac{19\pi}{9}.$$

(d) Convert each of the following angles from degrees to radians:

$$900^\circ \qquad -360^\circ \qquad 90^\circ \qquad -270^\circ \qquad 120^\circ \qquad -405^\circ \qquad -390^\circ \qquad -320^\circ.$$

(e) Without using a calculator, find each of:

(i) $\log_{10} 100$.

(ii) $\log_{10} 1$.

(iii) $\ln e^6$.

(iv) $\ln 1$.

(f) On a set of axes sketch a graph of $y = \sin x$ and $y_1 = \sin 2x$ for $x \in [-2\pi, 2\pi]$.
On another set of axes sketch $y = \sin x$ and $y_2 = 2\sin x$ for $x \in [-2\pi, 2\pi]$.

3. Answer each of the following questions, showing all working.

(a) There are eight equations given in this question, and you need to match each equation with its corresponding graph. The graphs are shown in Question 1, Part (a).

(i)	Equation is:	$y = -2x^2 - 1$.	**(ii)**	Equation is:	$y + 2x - 1 = 2$
(iii)	Equation is:	$-2y - 2x = 1$	**(iv)**	Equation is:	$y = x^2 + 1$.
(v)	Equation is:	$y = e^{-x}$.	**(vi)**	Equation is:	$-3y + x - 1 = 3$
(vii)	Equation is:	$-y + x - 1 = -3$	**(viii)**	Equation is:	$y = -2 \mid 4x \mid$.

(b) If \$100 is invested for 6 years at a rate of 24% per annum, find the final balance if interest compounds:

(i) annually?

(ii) every six months?

(iii) monthly?

(iv) continuously?

(c) Convert each of the following angles from radians to degrees:

$$3\pi \qquad -2\pi \qquad \frac{5\pi}{2} \qquad \frac{-\pi}{2} \qquad \frac{-8\pi}{3} \qquad \frac{-7\pi}{4} \qquad \frac{-5\pi}{6} \qquad \frac{17\pi}{9}.$$

(d) Convert each of the following angles from degrees to radians:

$$360^\circ \qquad -720^\circ \qquad 450^\circ \qquad -90^\circ \qquad -120^\circ \qquad -135^\circ \qquad 510^\circ \qquad 200^\circ.$$

(e) Without using a calculator, find each of:

(i) $\log_{10}\ 1000$.

(ii) $\log_{10}\ \dfrac{1}{1000000}$.

(iii) $\ln\ 1$.

(iv) $\ln\ \dfrac{1}{e^1}$.

(f) On a set of axes sketch a graph of $y = \sin x$ and $y_1 = -2\sin 2x$ for $x \in [-2\pi, 2\pi]$.
On another set of axes sketch $y = \sin x$ and $y_2 = \sin\dfrac{x}{2}$ for $x \in [-2\pi, 2\pi]$.

4. Answer each of the following questions, showing all working.

(a) There are eight equations given in this question, and you need to match each equation with its corresponding graph. The graphs are shown in Question 1, Part (a).

(i) Equation is: $3y - 2x + 1 = 3$ **(ii)** Equation is: $-2y + 3x - 1 = 3$

(iii) Equation is: $y = -2x^2 + 1$. **(iv)** Equation is: $x - 3 = 0$

(v) Equation is: $y = -3 \mid -3x \mid$. **(vi)** Equation is: $y + 2x = -1$

(vii) Equation is: $-3y - 3x - 2 = -2$ **(viii)** Equation is: $y = 2x^2 + 1$.

(b) If \$100 is invested for 6 years at a rate of 30% per annum, find the final balance if interest compounds:

(i) annually?

(ii) every six months?

(iii) monthly?

(iv) continuously?

(c) Convert each of the following angles from radians to degrees:

$$3\pi \qquad -2\pi \qquad \frac{5\pi}{2} \qquad \frac{-3\pi}{2} \qquad \frac{8\pi}{3} \qquad \frac{-3\pi}{4} \qquad \frac{7\pi}{6} \qquad \frac{16\pi}{9}.$$

(d) Convert each of the following angles from degrees to radians:

$$360^\circ \qquad -540^\circ \qquad 450^\circ \qquad -270^\circ \qquad -120^\circ \qquad -135^\circ \qquad -210^\circ \qquad 440^\circ.$$

(e) Without using a calculator, find each of:

(i) $\log_{10}\ 1000000$.

(ii) $\log_{10}\ \dfrac{1}{10000}$.

(iii) $\ln\ 1$.

(iv) $\ln\ \dfrac{1}{e^1}$.

(f) On a set of axes sketch a graph of $y = \sin x$ and $y_1 = -2\sin x$ for $x \in [-2\pi, 2\pi]$.
On another set of axes sketch $y = \sin x$ and $y_2 = \dfrac{1}{2}\sin 2x$ for $x \in [-2\pi, 2\pi]$.

5. Answer each of the following questions, showing all working.

(a) There are eight equations given in this question, and you need to match each equation with its corresponding graph. The graphs are shown in Question 1, Part (a).

(i) Equation is: $y + 2x - 1 = -2$ **(ii)** Equation is: $y = -3 \mid -4x \mid$.

(iii) Equation is: $y = 4 \mid -3x \mid$. **(iv)** Equation is: $3y - 3x + 2 = 0$

(v) Equation is: $2y + 2x - 2 = -2$ **(vi)** Equation is: $y = 3x^2 - 2$.

(vii) Equation is: $-2y - x + 2 = -1$ **(viii)** Equation is: $x - 3 = 3$

(b) If \$100 is invested for 2 years at a rate of 6% per annum, find the final balance if interest compounds:

(i) annually?

(ii) every six months?

(iii) monthly?

(iv) continuously?

(c) Convert each of the following angles from radians to degrees:

$$\pi \qquad -3\pi \qquad \frac{5\pi}{2} \qquad \frac{-\pi}{2} \qquad \frac{4\pi}{3} \qquad \frac{-11\pi}{4} \qquad \frac{5\pi}{6} \qquad \frac{5\pi}{9}.$$

(d) Convert each of the following angles from degrees to radians:

$$720^\circ \qquad -900^\circ \qquad 450^\circ \qquad -90^\circ \qquad -480^\circ \qquad -135^\circ \qquad -150^\circ \qquad -100^\circ.$$

(e) Without using a calculator, find each of:

(i) $\log_{10}\ 1000000$.

(ii) $\log_{10}\ 1$.

(iii) $\ln\ e^1$.

(iv) $\ln\ \dfrac{1}{e^6}$.

(f) On a set of axes sketch a graph of $y = \sin x$ and $y_1 = -\sin\dfrac{x}{2}$ for $x \in [-2\pi, 2\pi]$.

On another set of axes sketch $y = \sin x$ and $y_2 = \dfrac{1}{2}\sin 2x$ for $x \in [-2\pi, 2\pi]$.