

Mathematics Support Capsules

BASIC ALGEBRA
0. DIAGNOSTIC

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Combine and simplify as much as possible the following expressions:

Questions

Answers

1) $\frac{1}{a+b} - \frac{2a}{a^2-b^2}$

1) _____

2) $\frac{x^2+2x+1}{2x^2} \div \frac{x+1}{x+2}$

2) _____

3) $-\frac{a+b}{ac+bd}$

3) _____

4) $\frac{(2a)^3}{a^5}$

4) _____

5) $(0.2a^2)^4$

5) _____

6) $\frac{8y^n}{-2y^{n-1}}$

6) _____

7) $\sqrt[3]{-64y^{27}}$

7) _____

8) $\sqrt{a^2 + b^2}$

8) _____

9) $(a + b)^3$

9) _____

10) $(\sqrt{x} + 3\sqrt{y})(\sqrt{x} - \sqrt{y})$

10) _____

Solve the following equations for x :

11) $x^3 - x^2 - 6x = 0$

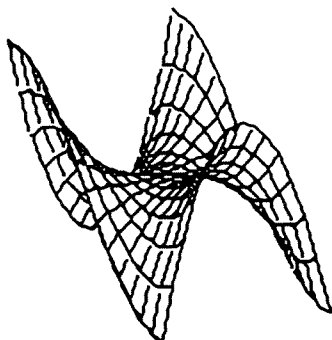
11) _____

12) $x^2 + 7x = -3$

12) _____

Now check your answers on the next page!

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BASIC TRIGONOMETRY 0. DIAGNOSTIC TEST

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Answer the following questions without calculators or trig tables. (Leave answers like 53π or $\sin 13^\circ$ as is.)

Questions

Answers

1)

(a) $30^\circ =$

(b) $\frac{3\pi}{2}$ radians =

(c) $127^\circ =$

1)

a. _____ radians

b. _____ degrees

c. _____ radians

2)

(a) $\sin 60^\circ =$

(b) $\tan\left(-\frac{3\pi}{4}\right) =$

(c) $\sec\left(\frac{\pi}{2}\right) =$

2)

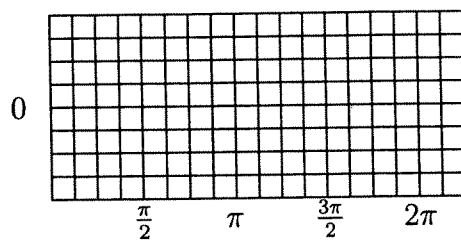
a. _____

b. _____

c. _____

- 3) Sketch the graph of $\sin x$.
(Make your vertical scale as large as possible.)

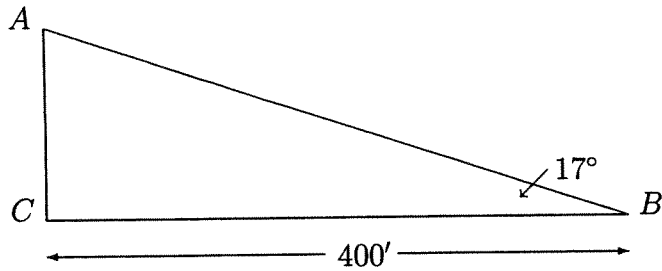
3)



- 4) Given $\tan \theta = \frac{6}{7}$, find $\sin \theta$

4) _____

- 5) Solve the following right triangle:
(i.e., determine missing sides and angles.)



5)

$$\overline{AB} = \underline{\hspace{2cm}}$$

$$\overline{AC} = \underline{\hspace{2cm}}$$

$$\angle A = \underline{\hspace{2cm}}$$

- 6) Relate to $\sin \theta$ and $\cos \theta$

(a) $\cos(-\theta) =$

(b) $\sin(\frac{\pi}{2} - \theta) =$

(c) $\sin 2\theta =$

6)

a. $\underline{\hspace{2cm}}$

b. $\underline{\hspace{2cm}}$

c. $\underline{\hspace{2cm}}$

- 7) Express in terms of \sin and \cos of A and B
 $\sin(A - B) =$

7) $\underline{\hspace{2cm}}$

8) $\frac{d}{dx}(\cos 3x + \tan x) =$

8) $\underline{\hspace{2cm}}$

9) $\cos^{-1}(\sqrt{3}/2) =$

9) $\underline{\hspace{2cm}}$

Check your answers on the next page!

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