



NO CALCULATOR

① Solve for  $y$  in the following system of equations:

$$\begin{aligned} (x - y = -1) \times 3 \\ 3x + 5y = 21 \end{aligned}$$

- A. 2
- B. 3
- C. 9
- D. 12

$$\begin{aligned} 3x - 3y &= -3 \\ -(3x + 5y &= 21) \\ \hline -8y &= -24 \quad y = 3 \end{aligned}$$

② Solve the following system of equations:

$$\begin{aligned} 4x + 2y &= 8 \\ -3x + y &= -1 \Rightarrow y = 3x - 1 \end{aligned}$$

$$\begin{array}{l} 4x + 2(3x - 1) = 8 \\ 4x + 6x - 2 = 8 \\ 10x - 2 = 8 \\ 10x = 10 \\ x = 1 \end{array}$$

$$\begin{array}{l} -3(1) + y = -1 \\ -3 + y = -1 \\ y = 2 \end{array}$$

$(1, 2)$

- A.  $(-3, 10)$
- B.  $(-1, 6)$
- C.  $(1, 2)$
- D.  $(3, 2)$

③ How many solutions does this system of equations have?

$$\begin{aligned} y &= 3x + 7 \\ y &= 3x - 4 \end{aligned}$$

- A. no solution
- B. one solution
- C. an infinite number of solutions
- D. cannot be determined without solving

slopes are equal  
So lines are parallel,  
thus they will never intersect!

# Chapter 7

CALCULATOR PERMITTED

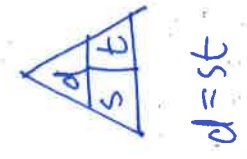
4 Which of the following systems of linear equations has a solution of (-3, 4)?

- A.  $\begin{cases} 2x - 3y = 6 \\ y = 3x - 13 \end{cases}$   $\Rightarrow -6 - 12 = 6 \Rightarrow -18 \neq 6$
- B.  $\begin{cases} 2x - 3y = 6 \\ y = 3x + 13 \end{cases}$   $\Rightarrow -6 + 12 = 6 \Rightarrow 6 = 6$
- C.  $\begin{cases} 2x + 3y = 6 \\ y = 3x - 13 \end{cases}$   $\Rightarrow 4 = -9 - 13 \Rightarrow 4 \neq -22$
- D.  $\begin{cases} 2x + 3y = 6 \\ y = 3x + 13 \end{cases}$   $\Rightarrow 4 = 3(-3) + 13 \Rightarrow 4 = -9 + 13 \Rightarrow 4 = 4$

5 Two planes have a cruising speed of 570 km/h without wind. The first plane flies for 12 hours against a constant headwind. The second plane flies for 10 hours in the opposite direction with the same wind (a tailwind). The second plane flies 370 km less than the first plane.

Determine two equations that could be used to solve for the wind speed, w, and the distance travelled by the first plane, d.

- A.  $\begin{cases} (570 - w)(12) = d \\ (570 + w)(10) = d - 370 \end{cases}$
- B.  $\begin{cases} (570 - w)(12) = d \\ (570 + w)(10) = d + 370 \end{cases}$
- C.  $\begin{cases} (570 - w)(12) = d \\ (570 - w)(10) = d - 370 \end{cases}$
- D.  $\begin{cases} (570 + w)(12) = d \\ (570 - w)(10) = d + 370 \end{cases}$



$d = (570 - w)(12)$   
 $d - 370 = (570 + w)(10)$

6

Joey bought 8 books. Some books cost \$12 each the rest cost \$18 each. He spent a total of \$108. Which of the following systems of linear equations could represent the given situation?

- A.  $\begin{cases} x + y = 8 \\ 12x + 18y = 108 \end{cases}$
- B.  $\begin{cases} x + y = 108 \\ 12x + 18y = 8 \end{cases}$
- C.  $\begin{cases} x + 12y = 8 \\ x + 18y = 108 \end{cases}$
- D.  $\begin{cases} 12x + y = 8 \\ x + 18y = 108 \end{cases}$

7

Kim invested a total of \$1500 between two bonds. One bond earned 8% per annum and the other bond earned 10% per annum. In one year, Kim earned \$132 on her investments. How much did she invest in the bond that earned 10%?

- A. \$600
- B. \$750
- C. \$900
- D. \$1000

$x + y = 1500 \Rightarrow x = 1500 - y$   
 $0.08x + 0.10y = 132$   
 $0.08(1500 - y) + 0.10y = 132$   
 $120 - 0.08y + 0.10y = 132$   
 $120 + 0.02y = 132$   
 $0.02y = 12$   
 $y = \frac{12}{0.02} = 600$

Numerical Response

8 Solve for x:

$$3x + 4y = -16$$

$$x = 4y$$

$$3(4y) + 4y = -16$$

$$12y + 4y = -16$$

$$16y = -16 \quad y = -1$$

Answer

0 0 0 0 0 0 0 0 0 0

$$x = 4(-1)$$

$$x = -4$$

9

A package of 12 hex bolts and 10 anchor bolts weighs 7 pounds. A second package of 5 hex bolts and 15 anchor bolts weighs 4 pounds. How much does a single hex bolt weigh? Answer in pounds to one decimal place.

Record your answer neatly on the Answer Sheet.

$$(12x + 10y = 7) \times 3$$

$$(5x + 15y = 4) \times 2$$

$$\begin{array}{r} 36x + 30y = 21 \\ -(10x + 30y = 8) \\ \hline \end{array}$$

$$26x = 13$$

$$x = 0.5$$

Answer

0 0 0 0 0 0 0 0 0 0



CHAPTER 7  
Answer Key

No Calc M/C

- 1. B
- 2. C
- 3. A

Calc. M/C

- 4. D
- 5. A
- 6. A
- 7. A

Numerical Response

- 8.  $\overset{+}{0}\overset{-}{\bullet}$      4.
- 9.  $\overset{+}{\bullet}\overset{-}{0}$      0.  5



## UNIT CONVERSION

	Common Imperial	Imperial and Metric	Metric
<b>Length</b>	1 mile = 1760 yards 1 mile = 5280 feet 1 yard = 3 feet 1 yard = 36 inches 1 foot = 12 inches	1 mile $\approx$ 1.609 km 1 yard $\approx$ 0.9144 m 1 foot $\approx$ 0.3048 m 1 inch $\approx$ 2.54 cm	1 km = 1000 m 1 m = 100 cm 1 cm = 10 mm
<b>Mass (Weight)</b>	1 ton = 2000 pounds 1 pound = 16 ounces	1 pound $\approx$ 0.454 kg 1 ounce $\approx$ 28.35 g	1 t = 1000 kg 1 kg = 1000 g
<b>Common Abbreviations</b>	mile = mi yard = yd ton = ton feet = ' or ft inch = " or in pound = lb ounce = oz		kilometre = km metre = m centimetre = cm millimetre = mm tonne (metric ton) = t gram = g

## FORMULAE

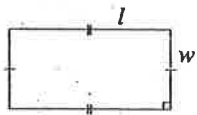
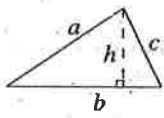
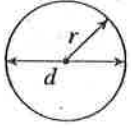
<p>(Put your calculator in Degree Mode)</p> <ul style="list-style-type: none"> <li>Right triangles</li> </ul> $\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan A = \frac{\text{opposite}}{\text{adjacent}}$ <p><b>Pythagorean Theorem</b></p> $a^2 + b^2 = c^2$ <p>distance = speed <math>\times</math> time</p>	<ul style="list-style-type: none"> <li>The equation of a line:  <math>y = mx + b</math>  <math>Ax + By + C = 0</math>  <math>y - y_1 = m(x - x_1)</math> </li> <li>The slope of a line:  <math>m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}</math> </li> </ul>
<b>Math Tiles Legend</b>	



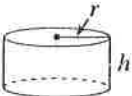
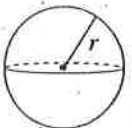
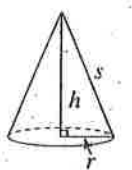
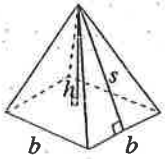
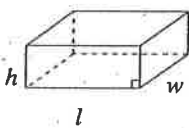
## GEOMETRIC FORMULAE

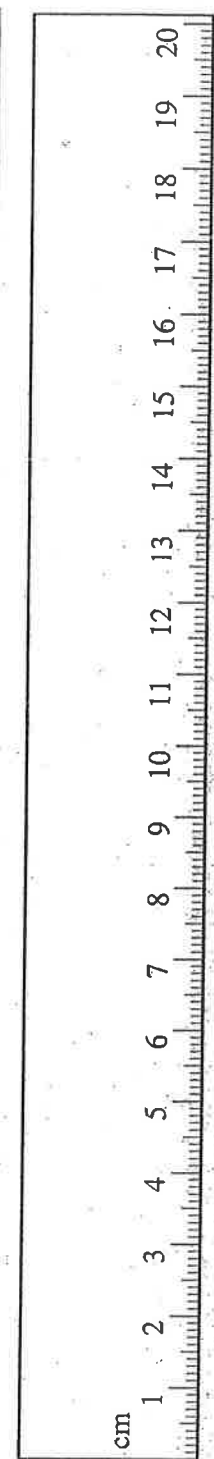


Key Legend	
$l$ = length $w$ = width $b$ = base $h$ = height $s$ = slant height $r$ = radius $d$ = diameter	$P$ = perimeter $C$ = circumference $A$ = area $SA$ = surface area $V$ = volume

Geometric Figure	Perimeter	Area
Rectangle 	$P = 2l + 2w$ or $P = 2(l + w)$	$A = lw$
Triangle 	$P = a + b + c$	$A = \frac{bh}{2}$
Circle 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

**NOTE:** Use the value of  $\pi$  programmed in your calculator rather than the approximation of 3.14.

Geometric Figure	Surface Area	Volume
Cylinder 	$A_{top} = \pi r^2$ $A_{base} = \pi r^2$ $A_{side} = 2\pi rh$ $SA = 2\pi r^2 + 2\pi rh$	$V = (\text{area of base}) \times h$
Sphere 	$SA = 4\pi r^2$ <b>or</b> $SA = \pi d^2$	$V = \frac{4}{3}\pi r^3$
Cone 	$A_{side} = \pi rs$ $A_{base} = \pi r^2$ $SA = \pi r^2 + \pi rs$	$V = \frac{1}{3} \times (\text{area of base}) \times h$
Square-Based Pyramid 	$A_{triangle} = \frac{1}{2}bs$ (for each triangle) $A_{base} = b^2$ $SA = 2bs + b^2$	$V = \frac{1}{3} \times (\text{area of base}) \times h$
Rectangular Prism 	$SA = wh + wh + lw + lw + lh + lh$ <b>or</b> $SA = 2(wh + lw + lh)$	$V = (\text{area of base}) \times h$
General Right Prism	$SA = \text{the sum of the areas of all the faces}$	$V = (\text{area of base}) \times h$
General Pyramid	$SA = \text{the sum of the areas of all the faces}$	$V = \frac{1}{3} \times (\text{area of base}) \times h$



**NOTE:** Use the value of  $\pi$  programmed in your calculator rather than the approximation of 3.14.

