# ANSWERS TO TRY THESE

#### 1.1 Constants, Variables, and Expressions

(page 5)

1.

a) The variable quantity is the download cost.

b) The constant is the fixed service cost.

c) Annual cost = 50 + 2, where represents the number of downloaded photographs.

d) Annual cost = 50 + 220 = 50 + 40 = 90  
 The annual cost of downloading 20 photos is $90.

3.

a) There are 2 variable quantities in this problem.

b) There are no constants in this problem.

#### 2.1 Vectors

(page 9)

1. and

2. Two vectors are equal because they have the same direction and magnitude.

#### 2.2 Addition, Subtraction, and Scalar Multiplication of Vectors

(page 13)

1.

2.

#### 2.3 Magnitude, Direction, and Components of a Vector

(page 18)

1.

2.

3. and

4.

#### 2.4 The Dot Product of Two Vectors, the Length of a Vector, and the Angle Between Two Vectors

(page 23)

1.

2.

3.

4.

5.

6.

#### 2.5 Parallel and Perpendicular Vectors, The Unit Vector

(page 27)

1. Parallel

2. Perpendicular

3. Neither parallel nor perpendicular

4.

#### 2.6 The Vector Projection of One Vector onto Another

(page 32)

1.

2.

#### 3.1 Three Dimensional Vectors

(page 36)

1. units

2. units

3.

4.

#### 3.2 Magnitude and Direction Cosines of a Vector

(page 41)

1.

2.

3. {0.802, -0.267, 0.535}

4.

#### 3.3 Arithmetic on Vectors in 3-Dimensional Space

(page 45)

1.

2.

3.

4.

#### 3.4 The Unit Vector in 3-Dimensions and Vectors in Standard Position

(page 49)

1.

2.

3.

4.

#### 3.5 The Dot Product, Length of a Vector, and the Angle between Two Vectors in Three Dimensions

(page 54)

1.

2.

3.

4.

5.

6.

#### 3.6 The Cross Product: Algebra

(page 59)

1.

2.

3.

#### 3.7 The Cross Product: Geometry

(page 65)

1.

2.  **=**

3. = 12.2 units

4.

|  |
| --- |
|  |
|  |

5. Perpendicular since

6. Parallelogram is square units. Triangle is (½ of = square units.

#### 4.1 Matrices

(page 70)

1.

a)

b)

c)

2. True

3.

a) 5

b) 2

c) 1

d) 4

4.

5.

6.

7. <4,3,2>

8. or

#### 4.2 Addition, Subtraction, Scalar Multiplication, and Products of Row and Column Matrices

(page 75)

1.

2.

3. Not possible

4.

5.

6.

7. Not defined

8.

9.

10.

#### 4.3 Matrix Multiplication

(page 79)

1.

2.

3. Is not commutative

4.

5.

6.

7.

8.

9.

10.

11. Not defined

#### 4.4 Rotation Matrices in 2-Dimensions

(page 83)

1.

2.

3.

4.

5.

6.

7.

8.

9.

#### 4.5 Finding the Angle of Rotation Between Two Rotated Vectors in 2-Dimensions

(page 87)

1.

2.

3.

4.

5. = -

#### 4.6 Rotation Matrices in 3-Dimensions

(page 92)

1.

2.

3.

#### 5.1 The Basic Trigonometric Functions

(page 97)

1.

a) cos, tan

b) cos, tan

c) cos, tan

d) cos, tan

e) cos, tan

2.

a) , cos, tan

b) , cos

c) , cos, tan

d) , cos

e) , cos

#### 5.2 Circular Trigonometry

(page 102)

1. (0.7071, 0.7071)

2. (0.9962, 0.0872)

3. (6.4705, 4.8396)

4. (-7.0711, 7.0711)

5. 34.31 ft

6. 6 units

#### 5.3 Graphs of the Sine Function

(page 107)

1.

a) -0.7071

b) -1

c) -0.7071

d) 0

2.

a) 0.5

b) 0.7071

c) 0.8660

d) 1

3.

a) True, since 0.9986 > 0.9781

b) False, since 0.4226 < 0.5736

c) True, since 0.5 = 0.5

d) True, since

4.

a) True, since

b) False, since

c) True, since

d) True, since

#### 5.4 Graphs of the Cosine Function

(page 110)

1.

a) -0.7071

b) 0

c) 0.7071

d) 1

2.

a) 0.8660

b) 0.7071

c) 0.5

d) 0

3.

a) False, since 0.0523 < 0.2079

b) False, since 0.7071 < 0.9063 (Be careful here: 0.7071 > –0.9063, but the negative sign tells us the object is the left of the observer. Think absolute value. At 45°, the object is 0.7071 to the right of the observer. At 145°, the object is 0.9063 units to the left of the observer, and, therefore, farther from the observer.)

c) False, since is |0.8660| =|-0.8660|

d) True, since 0 = 0

#### 5.5 Amplitude and Period of the Sine and Cosine Functions

(page 116)

1.

a)

b)

c)

2. 3 complete cycles. Period is Amplitude is 4.

3. of a complete cycle. Period is . Amplitude is 5.

4. , where

5. , where   
6.

We need to specify both in . Since the amplitude is 3 Since the curve makes two complete cycles from 0° to 180°, it must make 4 complete cycles from 0° to 360°. So,

7.

We need to specify both in . Since the amplitude is 4 Since the curve makes three complete cycles from 0° to 90°, it must make 12 complete cycles from 0° to 360°. So, .