Sections 7.6 (starting at question #53), 8.1, 8.2, 8.3, 8.4 and all of 4.5

1. Approximate the solutions of the equation to four decimal places that are in the interval [0, 2π). <Check the mode of your calculator!>

$$4\cos^2 x - 2\cos x - 5 = 0$$

A. $2.6807, 3.6025$

B. $1.3956, 0.8956$

C. $1.3956, 4.8875$

D. $0.4609, 5.8223$

E. None of the above

2. Which of the following is a unit vector in the same direction as $a = -3i + 4j$.

A. $-3i + 4j$

B. $-\frac{3}{5}i + \frac{4}{5}j$

C. $3i - 4j$

D. $\frac{3}{5}i - \frac{4}{5}j$

E. None of the above

3. An airplane leaves Point A and travels in the direction of 100º for 150 miles. It then travels in the direction of 220º for 350 miles. To the nearest mile, how far is it now from Point A? <Check the mode of your calculator!>

A. 345 miles

B. 444 miles

C. 414 miles

D. 304 miles

E. None of the above

Sections 7.6 (starting at question #53), 8.1, 8.2, 8.3, 8.4 and all of 4.5

4. Find the smallest positive angle between the positive x-axis and the vector $\langle -5, 9 \rangle$ rounded to the nearest tenth of a degree.

A. 29.1º

B. 150.9º

C. 60.9º

D. 119.1º

E. None of the above

5. Which function has vertical asymptotes of $x = 3, x = -2$, horizontal asymptote $y = 4$ and x-intercepts 1 and -5?

A. $f(x) = \dfrac{4(x-3)(x+2)}{(x-1)(x+5)}$

B. $f(x) = \dfrac{4(x+3)(x-2)}{(x+1)(x-5)}$

C. $f(x) = \dfrac{4(x-1)(x+5)}{(x-3)(x+2)}$

D. $f(x) = \dfrac{4(x+1)(x-5)}{(x+3)(x-2)}$

E. None of the above

Sections 7.6 (starting at question #53), 8.1, 8.2, 8.3, 8.4 and all of 4.5

6. Which of the following statements are true about the function?

$$f(x)=\frac{4x^2+3x-1}{2x-3}$$

I. There is no horizontal asymptote.

II. There are no vertical asymptotes.

III. The y-intercept is 2.

A. Only Statement I is true.

B. Only Statement II is true.

C. Only Statements I and III are true.

D. None of the statements are true.

E. All three statements are true.

7. There are two distinct $\triangle ABC$ with $\alpha = 41^\circ$, $a = 11.2$ and $b = 15.3$. Find the smaller value of two angles γ to the nearest degree.

A. $\gamma = 75^\circ$

B. $\gamma = 64^\circ$

C. $\gamma = 23^\circ$

D. $\gamma = 31^\circ$

E. None of the above

8. Given $\triangle ABC$ with sides $a = 21.4$, $b = 15.2$ and $c = 11.3$, find the value of angle α to the nearest tenth of a degree.

A. 73.2°

B. 106.8°

C. 42.8°

D. 30.4°

E. None of the above

Sections 7.6 (starting at question #53), 8.1, 8.2, 8.3, 8.4 and all of 4.5

9. The bearing from Point A to Point B is N48ºW and the bearing from Point A to Point C is N21ºE. The distance from Point B to Point C is 175 miles and the distance from Point A to Point C is 57 miles. To the nearest mile, approximately how far is it from Point A to Point B?

A. 165 miles

B. 121 miles

C. 143 miles

D. 187 miles

E. None of the above

10. From Point P, the angle of elevation of the top of a nearby building is 32º. From a point 300 feet closer to the building, and on the line connecting Point P and the base of the building, the angle of elevation to the top of the same building is 41º. Rounded to the nearest foot, what is the height of the building?

A. 667 feet

B. 444 feet

C. 839 feet

D. 653 feet

E. None of the above

Sections 7.6 (starting at question #53), 8.1, 8.2, 8.3, 8.4 and all of 4.5

11. Find the angle between vectors $a = \langle 4, 2 \rangle$ and $b = \langle -5, 3 \rangle$ to the nearest tenth of a degree.

A. 100.1º

B. 122.5º

C. 109.4º

D. 105.6º

E. None of the above

12. An airplane, with airspeed of 250 miles per hour, is flying in the direction 65º and a 52 mile per hour wind is blowing directly from the west. What is the ground speed of the airplane rounded to the nearest mile per hour?

A. 276 mph

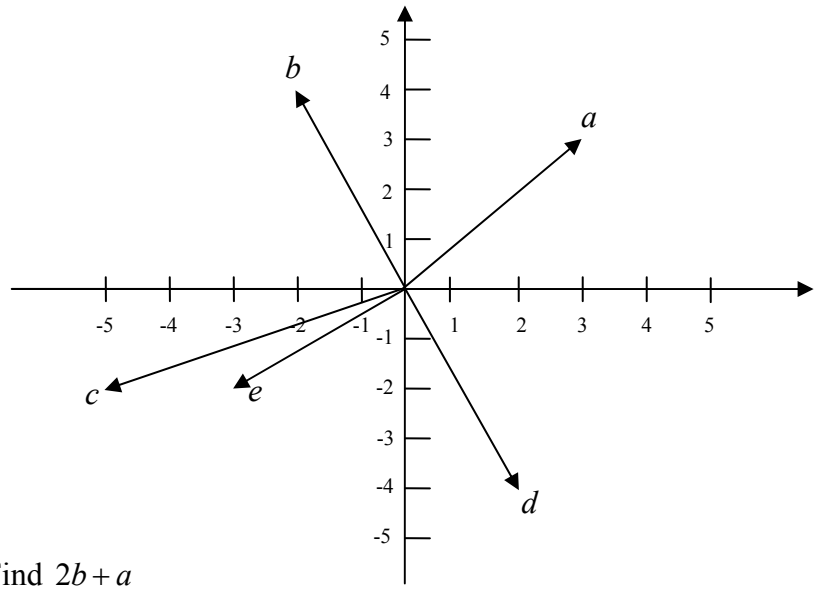
B. 285 mph

C. 298 mph

D. 294 mph

E. None of the above

Sections 7.6 (starting at question #53), 8.1, 8.2, 8.3, 8.4 and all of 4.5
Questions 13-14 All vector endpoints have integer values. Example: $e = \langle -3, -2 \rangle$.



13. Find $2b + a$

A. $\langle 10, 4 \rangle$

B. $\langle 11, -1 \rangle$

C. $\langle 4, 10 \rangle$

D. $\langle -1, 11 \rangle$

E. None of the above

14. Which one, of the following vectors, is orthogonal with vector *d*?

A. $3i - 2j$

B. $6i + 3j$

C. $8i - 4j$

D. $7i + 4j$

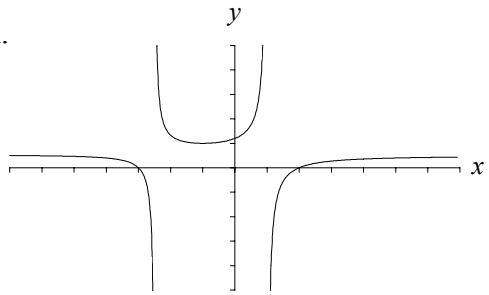
E. None of the above

Sections 7.6 (starting at question #53), 8.1, 8.2, 8.3, 8.4 and all of 4.5

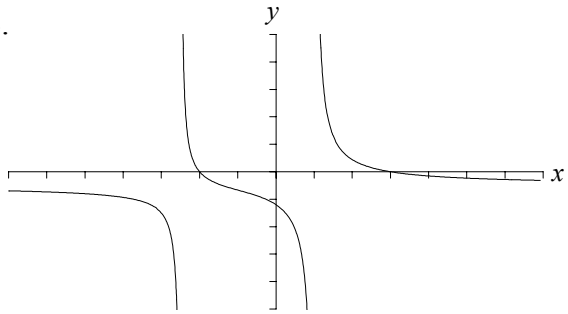
15. Which of the following most closely resembles the graph of the function:

$$f(x)=\frac{x^2-x-6}{2x^2+3x-5}\ ?$$

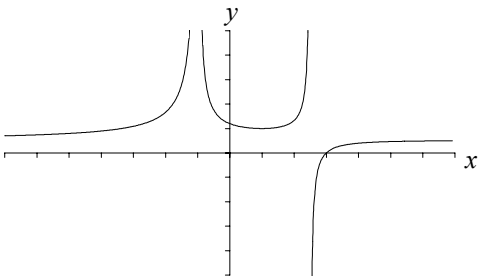
A.



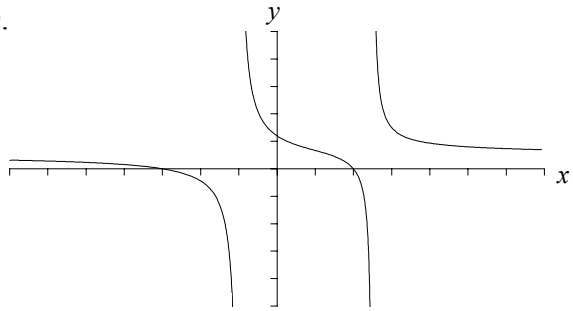
B.



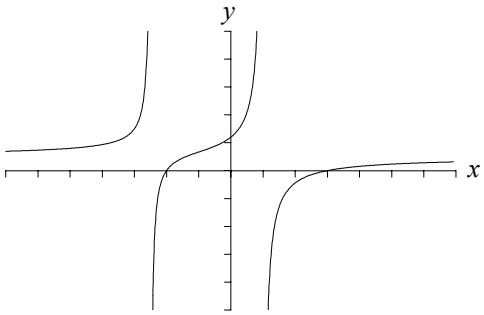
C.



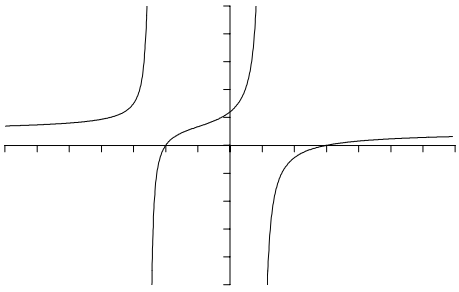
D.



E.



Sections 7.6 (starting at question #53), 8.1, 8.2, 8.3, 8.4 and all of 4.5

	Answer	Letter
1.	$2.6807_y 3.6025$	A
2.	$-\frac{3}{5}i+\frac{4}{5}j$ x	B
3.	304 miles	D
4.	119.1º	D
5.	$f(x)=\frac{4(x-1)(x+5)}{(x-3)(x+2)}$	C
6.	Only Statement I is true.	A
7.	$\gamma = 23º$	C
8.	106.8º	B
9.	187 miles	D
10.	667 feet	A
11.	122.5º	B
12.	298 mph	C
13.	$\langle -1,11 \rangle$	D
14.	$6i+3j$	B
15.		E