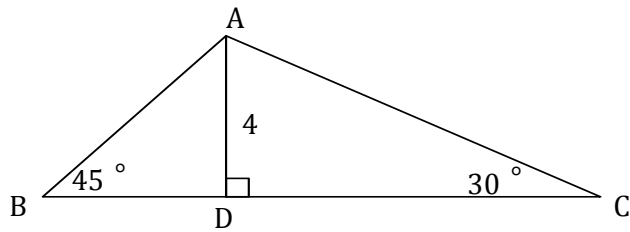


4. What is the exact length of BC?



- (A) 6  
(B) 12  
(C)  $4 + 4\sqrt{3}$   
(D)  $4\sqrt{2} + 4\sqrt{3}$
5. The point  $(6, -8)$  lies on the terminal arm of an angle  $\theta$  in standard position. What is the value of  $\sin \theta$ ?

(A)  $-\frac{4}{3}$

(B)  $-\frac{4}{5}$

(C)  $\frac{3}{5}$

(D)  $\frac{4}{5}$

6. Solve:  $\cos \theta = -0.6947$ , where  $0^\circ \leq \theta \leq 360^\circ$

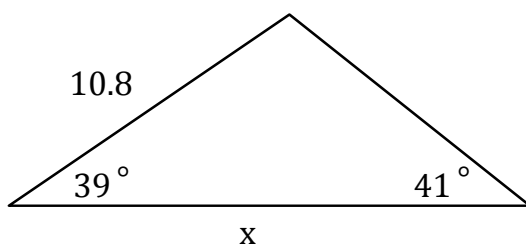
(A)  $\theta = 46^\circ$  and  $\theta = 134^\circ$

(B)  $\theta = 46^\circ$  and  $\theta = 314^\circ$

(C)  $\theta = 134^\circ$  and  $\theta = 226^\circ$

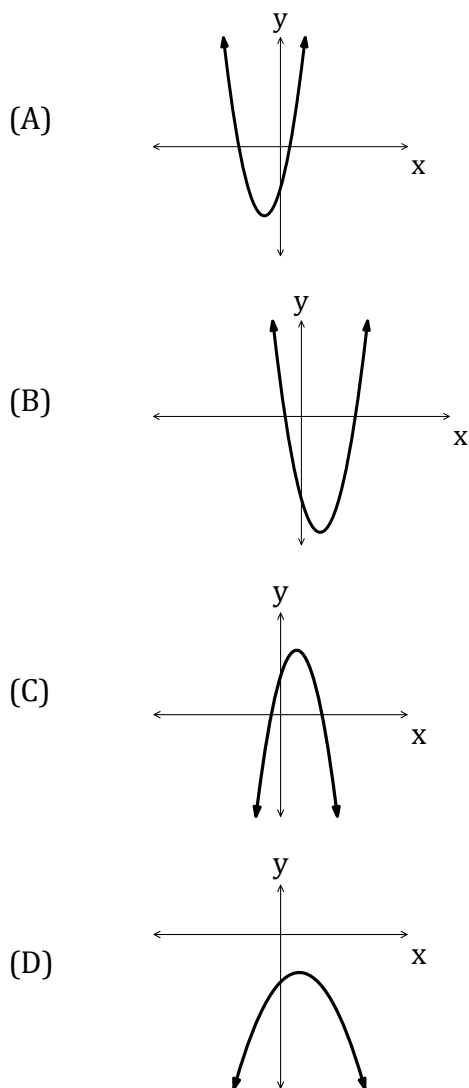
(D)  $\theta = 226^\circ$  and  $\theta = 314^\circ$

7. What is the length of  $x$ ?



- (A) 7.2  
(B) 10.4  
(C) 11.3  
(D) 16.2

8. Which represents the function  $y = 2x^2 - 4x - 5$  ?



9. Which represents a parabola with y-intercept  $-15$  and vertex  $(1, -5)$ ?

- (A)  $f(x) = -20(x - 1)^2 - 5$   
(B)  $f(x) = -20(x + 1)^2 + 5$   
(C)  $f(x) = -10(x - 1)^2 - 5$   
(D)  $f(x) = -10(x + 1)^2 + 5$

10. If  $y = 2x^2 + 12x + 10$  is written in the form  $y = a(x - p)^2 + q$ , what is the value of  $q$ ?

- (A)  $-26$   
(B)  $-8$   
(C)  $1$   
(D)  $28$

Mathematics 2200  
Sample Midterm Questions

11. A rancher plans to use 430 m of fencing to build a cattle enclosure with three equal sections. Which represents the total area of the enclosure in terms of its width,  $x$ ?



- (A)  $A = x(215 - 2x)$   
 (B)  $A = x(215 - x)$   
 (C)  $A = x(430 - 2x)$   
 (D)  $A = x(430 - x)$
12. Theresa's incorrect solution to the equation  $4x^2 - 7x - 3 = 0$  is shown. In which step does the **first** error occur?

Step 1 
$$x = \frac{7 \pm \sqrt{(-7)^2 - (4)(4)(-3)}}{2(4)}$$

Step 2 
$$x = \frac{7 \pm \sqrt{49 - 48}}{8}$$

Step 3 
$$x = \frac{7 \pm \sqrt{1}}{8}$$

Step 4 
$$x = 1, x = \frac{3}{4}$$

- (A) 1  
 (B) 2  
 (C) 3  
 (D) 4
13. Which describes the quadratic function that has vertex  $(-9, 5)$  and passes through the point  $(-4, -2)$ ?
- (A) The axis of symmetry is  $x = -9$  and the discriminant is negative.  
 (B) The axis of symmetry is  $x = -9$  and the discriminant is positive.  
 (C) The axis of symmetry is  $x = 9$  and the discriminant is negative.  
 (D) The axis of symmetry is  $x = 9$  and the discriminant is positive.

14. Solve:  $2x(x - 3) + 5(x - 3) = 0$

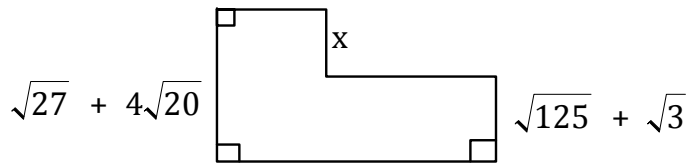
(A)  $x = -3, x = -\frac{5}{2}$

(B)  $x = -3, x = \frac{5}{2}$

(C)  $x = 3, x = -\frac{5}{2}$

(D)  $x = 3, x = \frac{5}{2}$

15. Determine a simplified expression for the value of  $x$ :



- (A)  $2\sqrt{3} + \sqrt{5}$
- (B)  $2\sqrt{3} + 3\sqrt{5}$
- (C)  $4\sqrt{3} + \sqrt{5}$
- (D)  $4\sqrt{3} + 3\sqrt{5}$

16. Write  $4x^8y^8\sqrt{5xy}$  as an entire radical.

- (A)  $\sqrt{20x^8y^8}$
- (B)  $\sqrt{20x^{10}y^8}$
- (C)  $\sqrt{80x^8y^8}$
- (D)  $\sqrt{80x^{10}y^8}$

17. Simplify completely:

$$\frac{\sqrt{6}}{\sqrt{3} + \sqrt{2}}$$

- (A)  $3\sqrt{2} - 2\sqrt{3}$
- (B)  $3\sqrt{2} + 2\sqrt{3}$
- (C)  $\frac{3\sqrt{2} - 2\sqrt{3}}{5}$
- (D)  $\frac{3\sqrt{2} + 2\sqrt{3}}{5}$

18. Simplify completely:

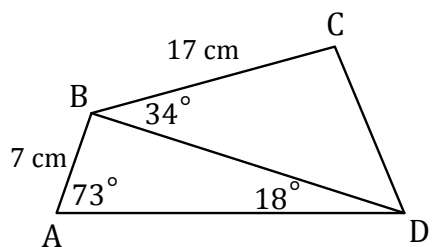
$$\frac{\sqrt{2}}{\sqrt{6}}$$

- (A)  $\frac{\sqrt{3}}{3}$
- (B)  $\frac{\sqrt{3}}{6}$
- (C)  $\frac{\sqrt{12}}{6}$
- (D)  $\frac{\sqrt{72}}{6}$

Mathematics 2200  
Sample Midterm Questions

30. Calculate the length of CD to the nearest tenth of a cm.

4 marks



31. From a height of 2 m, a volleyball is hit into the air. After 1 second, the ball reaches a maximum height of 7 m. Write the quadratic function, in the form  $y = a(x - p)^2 + q$ , that models the situation and use it to determine the height of the ball at 1.5 seconds.

3 marks

Function\_\_\_\_\_

Height\_\_\_\_\_

32. Algebraically determine the **exact** roots, in simplest form:

4 marks

$$16(x^2 - 1) = 24(2x + 1)$$

Mathematics 2200  
Sample Midterm Questions

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33. State restrictions on the variable and **solve**:  $\frac{1}{2}m - \sqrt{18 - m} = -1$

4 marks

ANSWERS:

4.C 5.B 6.C 7.D 8.B 9.C 10.B 11.A 12.B 13.B 14.C 15.B 16.C 17.A 18.B 19.D 20.A 21.A 22.C  
23.D 24.C 25.C 26.D 27.A

28.  $x = 3$ ,  $d = 9$

29. 266 667 barrels

30.  $CD = 12.2\text{cm}$

31. Function  $y = -5(x - 1)^2 + 7$  Height 5.75m

$$32. x = \frac{3 \pm \sqrt{19}}{2}$$

33. restriction:  $m \geq 18$ , solution  $m = 4$